

Rolled Iron Rail designed for the Balt^o & Wash^o Railway.

EIGHTH

ANNUAL REPORT

OF THE

PRESIDENT AND DIRECTORS

TO THE

STOCKHOLDERS

OF THE

BALTIMORE AND OHIO

RAIL ROAD COMPANY.

BALTIMORE:
PRINTED BY WILLIAM WOODY,
No 6 S. Calvert street.

1834.



Digitized by the Internet Archive
in 2013

EIGHTH ANNUAL REPORT.

IN the last Annual Report, the Board of Directors detailed very fully the situation of the Company at that time, and indicated the objects that would more especially engage their attention during the coming year.

These were; the completion of the Rail Road to Harper's Ferry; the construction of the lateral branch to Washington; and the perfection of the application of steam power for the purposes of general transportation.

It now remains for the Board of Directors to state what has been done towards the accomplishment of these several objects, during the year that has just ended.

Main Stem to Harper's Ferry.

The Chesapeake and Ohio Canal Company, in compliance with the agreement mentioned in the last annual report, whereby they undertook to graduate the Road for the rails, along the narrow passes of the Potomac, between the Point of Rocks and Harper's Ferry, have very nearly completed the work, and have been paid the sum agreed upon, by the Rail Road Company. It is gratifying to the Board to be able to add, that the arrangement entered into between the two Corporations, has, so far as executed, been carried out in a friendly, liberal, and accommodating spirit on the part of the President and Directors of the Canal Company. The intervening parts of this division, between Miller's Narrows and the Upper Point of Rocks, amounting to about eight miles in length, are now under contract; and it is expected that the whole will be finished soon enough to enable cars to pass the entire distance from Baltimore to Harper's Ferry, eighty-two miles, in all the coming November. [See Appendix E.]

When this shall be the case, a considerable portion of the trade, now carried on at the Point of Rocks, will be transferred to the Ferry, and the profit to the Rail Road Company, upon the carriage of goods and passengers, enhanced in proportion to the increased length of road used in the transportation.

Another immediate source of revenue to the Company from the completion of the road to that point, will be the greater number of passengers that will be attracted to this route. It is, however, still to be expected, that much of the produce intended for the Baltimore market, and descending the canal, will continue upon it to the Point of Rocks, whilst the goods for the West, which leave Baltimore, will, in like manner, continue on the Rail Road to its present termination at Harper's Ferry.

The advantages thus to be anticipated, when the main stem of the Baltimore and Ohio Rail Road shall be extended to Harper's Ferry, will be greatly increased upon the completion of the Winchester and Potomac Rail Road. This, it is understood, may be confidently expected, within the year 1835, when the great stream of western travel will, it is believed, be diverted into this course, aiming for the Ohio river, either at Parkersburg, by crossing the mountains from Winchester, or at Guyandotte, by ascending the valley of the Shenandoah to Staunton, and then turning to the West through Jennings's Gap, and by the White Sulphur Springs of Virginia. Indeed, the Board of Directors feel more and more confident that the Winchester and Potomac Rail Road is but the commencement of a chain of Rail Roads, by which the Western waters and the cotton growing districts of the south-west will become connected with the Atlantic sea board.

The construction of the Road to Harper's Ferry, affords the Company a ready access to the fertile valley of the Conococheague, by ascending the ravine of Israel's creek, about two miles below the Ferry Bridge and thence crossing the country by Hagerstown, towards the Pennsylvania line. The importance and value of this connexion with that part of Pennsylvania, of which the Conococheague is the drain, indicates a Rail Road on this route, most prominently, as one of the tributaries to the main stem of the Baltimore and Ohio Rail Road, and its construction may

be confidently anticipated before the expiration of many years.

The Board of Directors have effected a friendly and very satisfactory arrangement with the Frederick and Harper's Ferry Road Company, for the right of way along the bank of the Potomac, above Miller's Narrows, where the Canal, the Rail Road and the Turnpike, are all crowded into a slender strip of practicable ground, bounded by the Potomac, on the one side, and almost perpendicular cliffs upon the other.

Arrangements are in progress with the proprietors of the property at Harper's Ferry, by which a connexion, it is expected, can be effected with the Winchester and Potomac Road, by the time that road will be completed.

The Legislature of Maryland, with a liberality and public spirit that cannot be too highly praised, passed a law at its last session, authorising the Treasurer, to pay to the Company the whole amount of the State's subscription to the Stock, and the Board of Directors, availing themselves of the ordinance of the Mayor and City Council of Baltimore, passed in 1831, to the same effect, found themselves in funds, with the instalments of the individual Stockholders, to prosecute the construction of the main stem, to its completion to Harper's Ferry, at the earliest day.

The Baltimore and Port Deposit Rail Road Company have recently commenced the construction of their Rail Road within the City of Baltimore, and have extended it eastwardly from its junction, with the main stem of the Baltimore and Ohio Rail Road, as far as to the line of Canton. A survey and location of the route of this road has been made by Benj. H. Latrobe, Esq., chief engineer of the Baltimore and Port Deposit Rail Road Company, from whose Report, it appears, that the line of country, through which the road will pass, presents peculiar facilities for its economical and judicious construction. Its length from Baltimore to the town of Port Deposit is $41\frac{1}{4}$ miles. This line of road when completed, will connect at its Eastern termination with the Oxford and the Columbia Rail Road, and thus complete the communication between Washington and Philadelphia. The encouragement to the prosecution of this work, is very great, whether we regard the advantages to be realized by

it in point of travel and trade, either as a part of the great inland thoroughfare from north to south, or in its connexion with the magnificent valley of the Susquehanna.

Lateral Road to Washington.

Since the publication of the last Annual Report, this road, from the point of its departure from the main stem, at the gorge of the Patapsco, to the line of the District of Columbia, has been put under contract, and has advanced towards completion, with a rapidity highly gratifying. From the experience of the Board, in the deep cut near Baltimore, on the main stem, it was determined not to let to contractors the three deep and heavy cuts at Merrill's, Patuxent, and Snowden's ridges, on the lateral road; but to undertake them, under the charge of good superintendents, by the Company itself. This was accordingly done, and the saving that has already been effected, upon the lowest bids that were offered by responsible persons, has exceeded the expectation of the Board, and has fully justified the propriety of the course. These cuts, with the stone bridge across the Patapsco, will be the last portions of the lateral road, now under contract, that will be completed; but it is believed that the rails will be laid, and the road ready for use to the District line by the first day of July next. Within the District of Columbia, the ground has not yet been broken, but the Board have it in contemplation to proceed forthwith to the construction of the remaining portion of the work, as far as the City boundary. The Board have already taken measures to secure the requisite number of passenger cars and locomotive engines, to be placed on this line as soon as it will be in readiness to receive them.

An application was made to Congress, at the last session, for aid to make the road within the District, with the intention of terminating it, at or in the immediate vicinity of the General Post Office; and a bill granting 350,000 dollars for the construction of the road and the erection of depots, buildings, &c., was passed by the Senate, but failed in the House of Representatives.

The failure of this application, would have been the more to

be regretted, and must have occasioned serious embarrassment to the Company, but for the liberality of the Legislature of this State, at its last session, by which it consented to advance, at once, its entire subscription of \$500,000, and to exchange the $4\frac{1}{2}$ per cent. stock, that was to be issued for it, by the terms of the original subscription, for a five per cent. stock, which could be more readily and profitably disposed of, so as to secure the Company the full amount, in place of obliging them to suffer the loss inevitable upon attempting to force a four and a half per cent. stock into a depreciated market.

In the construction of the Washington Road, the Board have had regard to its durability, not less than to making it a source of immediate profit to those interested in the undertaking. The experience of the main stem has conclusively shown, how important it is to avoid the expense of repairs of the Railway, which not only materially affect the revenue, but occasion constant interruption and inconvenience to the travel on the road. True economy consists in constructing the road, in the first instance, so as to obviate the necessity of frequent repairs; and to enable the motive power used in transportation, to be employed to its fullest effect, without the fear of injury to the rails or bridges, over which it passes in the performance of its daily work.

The Board have, therefore, adopted the iron rail on the Washington Road of forty lbs. per yard, as proposed by their chief engineer, and modified in the shape of its face or surface by Ross Winans, and have caused all the viaducts to be built of stone, of the most permanent, yet simple construction. The granite viaduct over the Patapsco, consisting of eight elliptical arches of fifty-eight feet span each, with the road-way sixty-six feet from the surface of the water, the design of Benj. H. Latrobe, assistant engineer in the Company's service, will, when completed, be the largest structure of the kind in the United States. The facility with which all the materials for this bridge have been procured from the quarries on the Patapsco, on the line of this railway, has enabled the Contractor to build it for a sum comparatively moderate, and it is believed that, when completed its cost will be within the original esti-

mate, upon which it was determined to undertake it. The massive materials of which it is built, the care that has been taken in putting them together, and their foundation on the solid rock, are sure guarantees of its continuing durability. The stone viaducts over the two Patuxents, and that over the North-western Branch, near Bladensburg, are finished, and the Board are assured by the enterprising contractor, John McCartney, that the viaduct across the Patapsco, will, be completed in season to receive the rails with the other parts of the lateral road.

The Board are gratified in being able to state, that enough has been done, on the lateral road, to satisfy them that its cost will fall short of the original estimate, upon which the calculations, as to its probable profits, were based.

Machinery and Motive Power.

At a time when the construction of the railway approaches so nearly its present termination, the subject of machinery and motive power becomes of paramount importance, in considering the situation and prospects of the Company; for upon the cheapness and efficiency of the motive power, depend, in a great degree, the profits of the Stockholders.

From the first opening of the Road for travel to Ellicotts' Mills, the Board have had this subject under constant and anxious consideration. It was doubted, in the first instance, whether upon a Rail Road, with curves of only 400 feet radius, steam could be employed, or, if employed, whether it would not be more expensive than animal power. This doubt has been removed, and the Board are indebted to Peter Cooper, Esq., for proving the practicability of using Anthracite coal for the generation of steam in locomotive engines; and to the efforts of Phineas Davis for having perfected this experiment, in conjunction with the engineers and officers of this Company, and for demonstrating that these engines could be employed advantageously upon a road of such curvatures. In the last Annual Report the Board explained the advantages that were anticipated from the peculiar construction of the engines with vertical boilers, adopted by the Company, and they have now the satisfaction to state, that every anticipation has been more than real-

ized, not only as regards the durability of the boiler, but the efficient power of the engine upon the railway.

During the last year the boilers of the Atlantic and the Traveller were opened, after they had been running at various times, about six months in all, at the average of 80 miles *per diem*, with *Anthracite fires*. The tubes were most carefully examined, and the severest scrutiny could not discover that they were in any degree, inferior to what they were when first inserted, although no repairs whatever had been done to them in the interim. The inside of the boiler exhibited satisfactory evidence, that the circulation of the water, while subjected to the action of heat, and which has been considered so important, had been fully obtained, and that, to it, was to be attributed, in a great measure, the preservation of the tubes, uninjured, for so long a period.

The "Atlantic" and the "Traveller" were found in many particulars, susceptible of being much improved, and advantage was taken of the experience which they afforded, in the subsequent construction of the engines. One of these, the "Arabian," was completed and put upon the road in July last, and on the 1st of September, when a Report of the Chief Engineer was made, had worked for upwards of 40 days, at eighty-two miles per diem, in which distance the fire was never relaxed, without a day's interruption and without any repairs, and it was then in excellent order, nor was there any reason to believe, that it would not continue to do its daily task uninterruptedly, as long as the best engines that have been produced on either side of the Atlantic. It continued to run regularly from the 1st of September to the 11th of that month, making in all 50 days, during which it travelled 4100 miles, without requiring the smallest repair. On that day, by coming in contact with a stone, it was thrown off the road and slightly injured, so as to require some repairs. It has since been replaced in the line, and is now again regularly performing its trips as heretofore.

The weight of the "Arabian" when running, is $7\frac{1}{2}$ tons, with the full quantity of water and fuel in the boiler, of which 3 tons 17 cwt. rest upon the forward wheels, and 3 tons 13 cwt. on

the hinder wheels. The fire surface of the boiler is equal to 335 square feet, the cylinders are 12 inches in diameter, with a 22 inch stroke; and, under a pressure of 50 pounds to the circular inch, with the steam blowing off during the experiment, the engine has drawn 112 tons 18 cwt. 1 qr. gross, *exclusive* of itself and tender, at the rate of $11\frac{79}{100}$ miles per hour, on a level road, and carried the same load, though at a speed diminished to between six and seven miles per hour, up an ascent of 17 feet to the mile, occurring in a curve of rather less than 1000 feet radius. In this experiment all the four road wheels were geared together, and the steam produced by the boiler was found to be superabundant. When it is remembered, that the "Arabian" is only the third engine that has been constructed with a vertical tubular boiler, there is every reason to expect improvement in those which shall be built hereafter. In this engine, the steam, after being used in the cylinders, is made to pass round the boiler through hollow bands, within which are the pipes from the pumps to the boiler, and before it escapes, is employed in giving motion to the fan, by which the draft, necessary for the proper combustion of Anthracite, is produced. The simplicity of this contrivance, which belongs to Phineas Davis, by which the water is heated before it goes into the boiler, and the proper heat of the furnace is kept up, is only equalled by its value.

The Board feel the more satisfaction in the statements which they are thus enabled to make, because, during the experiments which have had so happy a result, they are aware, that they may have been censured occasionally, for not at once adopting the English engine, by those, who, unacquainted with the difficulties caused by the peculiar location of the Baltimore and Ohio Rail Road, believed, what was far from being the case, that the improved engines of Stephenson would answer as well upon it, as they did upon the Liverpool and Manchester Rail Road, or upon any of the comparatively straight Rail Roads in this country. There are now four effective engines on the road, the "Atlantic," "the Traveller," the "Arabian," and the "Mercury," and the Board expect, in a few days, to have two more,

upon the same plan, the "Antelope,"* and the "American," for which they have contracted with Charles Reeder of this City; in addition to which, there are eight more ordered and under contract.

The facilities which were anticipated, in the last Annual Report, from the erection of workshops for the construction of engines, on the Company's depot, have been fully realized, and will become more and more important, as the number of engines increase, and the entire transportation of the road is effected by them.

In the other departments of machinery, there have been several valuable improvements, tending to simplicity of construction and the diminution of the wear and tear.

After the experience of several years, the Board have come to the determination of employing an eight wheel car invented by Ross Winans for the transportation of passengers. This consists of two sets of ordinary running gear with steel springs, each set having what may be called a rose bolt, equidistant from the centre of motion of each wheel. The two sets are placed at the desired distance apart, and connected by a frame, stiffened by a thin iron plate on the sides, on which frame the body of the car rests. The great advantages of this mode of construction consist in the steadiness of the car, when moving on a curved road, or on one whose surface is uneven or slightly out of repair; for the two sets of wheels accommodate themselves to the inequalities of the surface, without affecting the car, resting as it does on the centre of each set. Another important object, which is attained, is safety: for while, in the ordinary four wheeled cars, the breaking of a wheel or an axle, might be productive of the most fatal consequences, such could not be the case, where, with eight wheels, there would be enough left to support it on the track until the train could be stopped. Again, upon a curved road it is necessary to place the pairs of wheels, of a four wheeled car as near as possible, so as to diminish friction, and this makes it necessary to build the body of the car very short, to prevent a disagreeable, and at times, dangerous vibration from side to side while the car is in rapid motion. In the eight wheel cars, on the contrary, the pairs of wheels of each set, are placed as near

* Since this Report was prepared one of these engines has also been placed on the road, and is now on trial, with every prospect of success.

together as can be desirable, under any circumstances, and the sets themselves may be as far apart as may be necessary to accommodate a car of any length, without increasing the friction on the rails when passing curves of the least radius, or producing the lateral motion, complained of. In point of economy too, this mode of construction is much preferable to the one hitherto employed.

For further particulars in relation to this department the Board refer to the Reports of the proper officers, hereto annexed. [See Appendix, A. and B.]

Having thus gone over those subjects which were particularly noticed in the last Annual Report, as claiming the attention of the Board, during the year that has just elapsed, it is necessary now to advert to the situation of the business of the Company, at this time, and to look forward to what may be the events of the next few years.

It was to have been expected, in the diminution of business, generally, throughout the country, since the date of the last Annual Report, that the receipts of the Company would have been materially reduced, and such too was the opinion currently entertained. This, however, has not been the case, and by a comparison of the receipts for corresponding periods in the official years 1833 and 1834, it will be found, that instead of being diminished, they have increased. This result is truly gratifying, since it is to be attributed, not to the augmentation of the trade at any one place, but to the multiplication of places with which trade is carried on by means of the road. If this has been sufficient, during a season of general depression, to prevent any decrease in the receipts of the transportation department, it may be safely expected, that when the business of the country rises again to its ordinary standard, the receipts of the road, even from the present sources, will be most materially augmented. In addition, however, it must be recollected, that the sources of revenue have been steadily multiplying, since the road was first opened, and will, no doubt, continue to do so for many years to come. This, with the reduction of the expenses of transportation, caused by the employment of steam power in its most efficient and economical mode upon the road, will, it is believed,

eventually secure a profitable return to the stockholders. For particulars relating to this branch of the service, the board refers to the Report of the Superintendent of Transportation, hereto annexed, [see appendix, document C.] where all the details will be found carefully digested. To the activity and foresight of this officer, the Board are much indebted for the extension of the business of the road into several sections of the country, the produce of which, before sought other modes of conveyance to market.

At a time when the road approaches so near to that point, which, as has latterly been generally understood, must limit its extension for the present, and where it unites with the Winchester and Potomac Rail Road, it is perhaps expected that the Board of Directors should express their opinions as to its further progress.

This seems more particularly to be called for, while the mind of this community is so feelingly alive to the efforts, which have been successfully made, by a rival city, to draw from its more appropriate channel, the rich commerce of the Western Valleys. The Baltimore and Ohio Rail Road, indeed, resulted from the public opinion, which in 1826—7, declared the necessity of an effort on the part of the City of Baltimore, to maintain possession of a trade, heretofore enjoyed, essential to her prosperity, and threatened by the enterprising public spirit of the neighbouring states. Those to whom the great enterprise of a Rail Road communication with the West, was intrusted, were furnished by their constituents with the splendid, but vague idea, only, of a bird's-flight line to the Ohio river. The subject was a new one in the United States, and, indeed, almost new in England; and although the best talent within the reach of the Company was obtained, every step taken for several years after the commencement of operations, was necessarily in the nature of an experiment. In looking back now with the experience that has been acquired, it is easy to see where money might have been saved, and how more work could have been done in the same time; and were the road to be commenced to-day, it is not to be doubted that it could be more economically constructed. At the time, too, that the Baltimore and Ohio Rail Road

was projected, the great avenue to the West, the river Potomac, was apparently open to the Company, and the use of it for the construction of the road, was contemplated, after the Report of the first reconnoissance of the engineers was received. This avenue, however, was closed by judicial decision; and it was by agreement and purchase only, that the Company have been able to advance as far as to the mouth of the Shenandoah. As one of the considerations of this agreement, the Rail Road Company was obliged to stipulate, that it would not attempt to ascend the banks of the Potomac beyond Harper's Ferry, until the Canal should be finished to Cumberland, provided this were done within the time allowed by the present charter of the Canal Company; so that, although the route to the West, by the Valley of Virginia, is still open, yet further progress up the Potomac is, for the present, not to be expected; and the immediate design of the proprietors of the road, is necessarily postponed in its accomplishment. Under these circumstances, it may well be asked, what are the views of the Board, with regard to that communication, with the West, which the Company was created to effect.

It has already been remarked, as well in this, as in the 7th Annual Report, that there was every reason to believe that a communication with the West might be effected, by means of the Valley of Virginia, and that as soon as the Winchester and Potomac Rail Road should be finished to Winchester, a great portion of western travel and transportation, would seek the Ohio river by that route, and that perhaps ultimately, a Rail Road from Winchester to Staunton, and from Staunton through Jennings's Gap, would complete the entire Railway communication.

In anticipating the adoption of this, however, as a practicable mode of establishing the desired connexion with the western waters, the Board have never lost sight of the original route by the Potomac, and they still firmly believe, that this will, one day, and that not a very remote one, be accomplished.

In the opinion of the Board of Directors, the immediate interest of the stockholders, as well as of the City of Baltimore, and the State, of which Baltimore is the heart and the emporium, *now lies in the completion of the Chesapeake and Ohio Canal to*

Cumberland; both in reference to the agreement of compromise already alluded to, and as forming an important link in the chain of communication, and furnishing a means of conveyance from the coal mines to tide, or to the junction with the Rail Road at Harper's Ferry. For the present, therefore, the Board would not think, even if they had it in their power, of making the Rail Road parallel with the Canal; but, taking up the route where the Canal terminates, at Cumberland, would push it across the mountains, upon the trace originally intended for it, and to the point of its original destination. The Chesapeake and Ohio Canal and the Baltimore and Ohio Rail Road ceasing to be, as they were for many years, hostile opponents, would then be united in interest, in every particular, and would jointly afford the desired communication. If, at any future day, the state of the trade should require it, and the income of the road should justify it, freed from the condition that now fixes Harper's Ferry as the western limit on the Potomac, the road might be brought down the River, and the continuous Rail Road communication, as first designed, be finally accomplished.

In the prosecution of the design thus marked out, the parties most deeply interested are the State of Maryland and the City of Baltimore; and it is to the public spirit and liberality of these, that the Board confidently look for the means to prosecute it successfully.

The State will soon be in the receipt of a very large annual income, without cost to herself, from the bonus which she received for the Washington Rail Road Charter. The income thus derived from internal improvement cannot be better applied than in prosecuting the system of which it is the result, and will constitute a fund for the payment of the interest on any loan, that the State may find occasion to make, in granting her aid to the completion of the plan already indicated. She will be the more influenced to lend her aid too, when, as is most confidently expected, upon the completion of the Washington road, and the road to Harper's Ferry, she will derive, in common with the other stockholders, a profitable interest upon her investments in those works; and when internal improvements, besides adding, as, at all events, they will do, to the wealth,

convenience, and happiness of the people, will become a source of actual and clear gain to the State.

The City of Baltimore, has, it is true, no fund like that of the State's bonus, to induce it to embark in the work, here mentioned; but it has still stronger inducements than any affecting the State at large. The certain improvement of every description of property, the increased prosperity of every class of the community, the multiplying population, the constantly accumulating trade, which must be the certain consequences of the completion of the road to the Ohio, surely offer sufficient inducements, for active effort and the most liberal contributions, even if the alternative were but to remain as our city now is, without either advancing or retrograding. But how strong do these inducements not become, when the alternative is the gradual loss of all that constitutes the wealth and prosperity of a commercial city, as the superior enterprise of a neighbour, overcoming the natural obstacles which gave to Baltimore the advantage over her, obtains possession of all the best sources of trade, leaving Baltimore in the condition of some village, on a once frequented highway, which a new and better road has left silently to decay.

Under these circumstances, and for these considerations, the Board of Directors cannot doubt, but that the time will soon arrive, when the State of Maryland, and the City of Baltimore, identified, as they are in fact, and as they ought to be in feeling, will lend that aid which they can so readily do, to ensure the completion of the communication to the West, upon the plan here suggested.

All that is necessary to hasten that time, is vigorous and concentrated efforts on the part of those most deeply interested, and the Board cannot, for a moment doubt, that these efforts will speedily be made, by their constituents and their fellow-citizens.

For a full exhibit of the receipts and expenditures of the Company during the past year, the Board refer to the annexed Report of the Treasurer. [See appendix, document D.]

On behalf of the Board,

P. E. THOMAS, *President.*

October 6, 1834.

[A.]

*Fifth Annual Report of the Chief Engineer of the Baltimore and
Ohio Rail Road.*

**Engineers' Office, Baltimore }
and Ohio Rail Road. }**

Baltimore, Oct. 1, 1834.

TO PHILIP E. THOMAS,
President of the Balt. and Ohio Rail Road Co.

PURSUANT to the regulations prescribed, I have now the honor to present the Fifth Annual Report of this department.

When the last Annual Report was made, the Surveying party were engaged in the definitive location and staking out for contract of the second and third divisions of the adopted route of the lateral Rail Road to the City of Washington; the surveying of the first and fourth divisions having been previously completed. This service was effected in October last, so that at the close of that month the entire line, from its intersection with the Baltimore and Ohio Rail Road to the northeastern boundary line of the City of Washington, being about 29 miles, was prepared for contract. During the succeeding month the surveying party completed the staking out of the lateral boundaries of cut and fill, as well as of those of the lands requisite for the roadway. That part of the line of this road situated within the limits of the City of Washington, and called the fifth, or city, division, has not yet been definitively located; the route has, however, been traced and estimated as far as New Jersey Avenue at the intersection of H street, distant from the aforesaid limits a fraction more than one mile. The position of the line within the territorial bounds of Washington, so as best to promote the accommodation of the public, will soon claim attention—to effect this object the concurrence of the municipal authorities of that city will be requisite.

In the month of December last a survey was directed by the board, and executed by this department, in order to ascertain if several miles of the line in the vicinity of Bladensburg could be changed and laid upon other ground without material injury to the road, so as to meet the views contained in a petition preferred upon the subject by an extensive proprietor, through whose lands the route had been laid and staked out for contract. Upon this survey, my Report, with the relative calculations and drawings, was made

on the 28th of that month, and the board made no change in the line as it had previously been run.

In the inclement weather of January, the route of the Balt. and Ohio Rail Road between the upper Point of Rocks and Miller's Narrows, that is, $8\frac{1}{4}$ continuous miles of the distance between the Point of Rocks and Harper's Ferry, was, under instructions received from thee, surveyed by this department, for the purpose of ascertaining the relative merits of a line proposed by the Chesapeake and Ohio Canal Company, as a substitute for the line run by Caspar W. Wever and approved by me, as stated in my last Annual Report. A Report, with the requisite calculations and drawings being made, the line, as proposed by the Canal Company, was, with certain modifications suggested on the part of the Baltimore and Ohio Rail Road Company, finally assented to, and adopted by both companies as the route upon which the Rail Road should be constructed. It was accordingly staked out for contract, in the month of April, and the boundary stakes of cut and fill, as well as those of the lands for condemnation and occupancy by the road, were planted.

During the month of August last, a survey and report was made of the graded surface of $4\frac{1}{10}$ miles of the Baltimore and Ohio Rail Road, including the narrow passes along the Potomac between the Point of Rocks and Harper's Ferry, which had been undertaken by the Chesapeake and Ohio Canal Company, and the work was found to be then very nearly completed.

In addition to the rough drafts executed during the progress of the surveys, the following described maps and profiles have been made during the year, and, as marked, remain on file in this office, viz:

Five maps and profiles, together representing the line of location of the lateral Rail Road to Washington, as staked out for contract: these maps are designated by the initial letters, *Lat. R. Rd. to Wn.* and are numbered from 1 to 5 inclusive. Their horizontal scale is 13.2 inches to the mile, and the vertical scale of the profiles an inch to 50 feet.

Ten maps comprising the location of the 6th division of the Baltimore and Ohio Rail Road from the Point of Rocks to Harper's Ferry, on a scale of 26.4 inches to the mile horizontal, and one inch to 40 feet vertical. These maps exhibit the relative positions of the Rail Road and Canal, and are each marked with the letters and words, *B. & O. R. Rd. on Potomac*, and numbered from 1 to 10 inclusive. In addition to the lettering and numbering, there is also a title placed upon the first map of each set.

A map and profile of the sixth division of the Baltimore and Ohio Rail Road, extending from the Point of Rocks to Harper's Ferry bridge, has been engraved on a scale of 2 inches to the mile horizontal, and 1 inch to 100 feet vertical, and accompanies this Report.

A sheet of drawings descriptive of the Rolled Malleable Iron Rail

of 40 lbs. per yard, adopted for the Washington Railway, is likewise annexed to this Report.

The field and office operations within the year having been adverted to, it may be added, that in their performance, generally, I have been essentially and efficiently aided by Benjamin H. Latrobe, Principal Assistant Engineer, who was charged with the immediate command of the parties on duty, and by Wm. P. Swann, Henry R. Hazlehurst, and James Murry, Assistant Engineers of much merit.

The process of construction as regards the graduation and masonry was commenced upon the 1st division of the Washington Rail Road about the time of submitting the last Annual Report, as will be seen on a reference to it; and soon afterwards, the lettings for these operations were extended as far as to the line of the District of Columbia, comprising, inclusive of three principal cuts, the conducting of which is under the superintendency of agents approved by the board, a length of line equal to about 26 miles. Upon these 26 miles all the masonry, excepting "the Thomas Viaduct" at the Patapsco, has been completed. The graduation upon the same has likewise been finished, except only at the three cuts alluded to, viz: at Merrill's ridge, Patuxent ridge, and Snowden's ridge. It is confidently expected that the graduation at these ridges will be completed by the first of December next, and that the arches of the viaduct over the Patapsco, will be closed about the same time. It is believed that seldom or never has so great a quantity of work been performed in so short a time, upon any line of internal improvement.

Very soon after, the $8\frac{1}{4}$ miles of the Baltimore and Ohio Rail Road between the upper Point of Rocks and Miller's Narrows, were prepared for contract, the graduation and masonry were commenced, and the work has progressed so rapidly that it is already completed.

Materials have likewise been procured, and are in the course of delivery, for laying down the first track of Railway upon the Washington Rail Road, and the first track upon the sixth division of the Baltimore and Ohio Rail Road, and contracts have been made for the construction of these respective tracks upon the plans matured by this department; and it may be here stated that the breadth of track between the iron rails of the Washington road is 4 feet $8\frac{1}{2}$ inches, (allowing a flange play of one inch,) and that the distance of the two tracks apart is to be six feet, measured from centre to centre of the rails. It is believed that a single track will be finished to Harper's Ferry Bridge during the present season, and that such progress in the same time will be made in the construction of the Railway upon the Washington lateral road, that a track will be opened and travelled from Baltimore to the line of the District of Columbia by the first of July next.

For a detailed statement of the operations connected with the construction of the graduation, masonry, and Railway of both

roads, I refer to the Report of Caspar W. Wever, superintendent of construction, which will contain all the information under this head that could be desired.

Before dismissing the subject of construction, I would, however, respectfully suggest that unless the 3 miles of the line in the District of Columbia, and the additional part within the territorial limits of Washington of one mile or more, shall be soon entered upon with a view to the extension of the road to, and into, the city, much disadvantage to the public will be experienced, whilst the revenue of the 26 miles constructed to the District line, must be rendered less productive.

The construction and improvement of Railway machinery, both as regards cars and locomotive engines, have steadily and successfully advanced, under the particular direction of George Gillingham, superintendent of machinery, and of the general superintendency of this department, aided by Ross Winans, assistant engineer of machinery, who possesses mechanical genius of a high order, as also does the contractor and manager in the company's machine shop, Phineas Davis. The Annual Report of the Superintendent of Machinery will detail the operations of his department with minuteness, for which reason, my observations touching this branch of the service may be the more general, and will mostly relate to the advances in improvement.

It was stated in my last Annual Report that a second locomotive engine had, in the year preceding, been built by Phineas Davis, and placed upon the road; the "Atlantic" engine, which had previously been put upon the road, having been the first one of any efficiency, produced by the call of the Board, for locomotive steam engines of American manufacture, to burn Anthracite coal. This second Engine was described in that Report, so far as to indicate the points of difference in construction between it and the "Atlantic" engine, previously built. It was stated that the new engine had cranks upon the axles of the road wheels instead of a spur and pinion, as in the "Atlantic," and that upon the failing of the crank axle it was resolved to gear with the spur and pinion, placing the pinion upon a shaft distinct from the axle of the road wheels. It was likewise mentioned that the separate shaft for the pinion was adopted to obviate the strains upon the gear observed to take place in the Atlantic engine from the unavoidable jolts of the road wheels upon the axle of which the pinion was placed. This action had been such as to break the cogs of the spur and pinion wheels. The separate shaft being geared to the axle of the road wheels by a connecting rod, would not be subject to the jolting action, but would revolve smoothly upon its bearings in the side frame, resting upon the springs. On repairing this engine, (which had been called the Indian Chief,) it was accordingly so modified, and again put in motion, with its appellation changed to that of "the Traveller." The Traveller came into action immediately after the compilation

of my last Annual Report. Its movements were important, as testing the virtue of the modified gearing, and indicating the form of construction to be given to the new engines. Upon sufficient trial, it was satisfactorily shown that the theory of a separate shaft was fully sustained in practice, and therefore this arrangement obtains in all the engines subsequently built, two of which, the "Arabian" and the "Mercury," by Davis & Gartner, have been put in motion recently. No fracture or failure in the spur or pinion has happened since the change to a separate shaft was made, and all the parts of this gearing, work and wear smoothly, and apparently, as advantageously as if in stationary engines.

Some other modifications have been introduced, such as in the dimensions of the boiler and cylinders, the form and number of tubes in the boiler, the proportion of connecting rods, and other appendages, the position of the springs, and the transmission of the waste steam from the cylinders to the fan, or blowing apparatus, and of the water to the boiler; all of which aimed at an increase of durability and power without increasing the weight of the whole machine beyond that of the "Traveller," or of causing more than two tons weight to bear upon the Railway at any one wheel, a limit not observed in the present arrangement of that engine.

A brief description of the three successively built engines, the Atlantic, the Traveller, and the Arabian, will now be given, in order that their distinctive differences may be more apparent.

The *Atlantic* has an upright tubular boiler, 51 inches in diameter, and 69 inches in height above the grate: the diameter of the fire place is $46\frac{1}{2}$ inches, and its height 22 inches: the height or length of the tubes is 16 inches, having each a diameter at the lower end of $1\frac{1}{2}$ inches, and at the upper end of $1\frac{1}{4}$ inches; the tubes are of hammered iron, and 282 in number; they terminate at top in a hot air chamber, the upper plane of which is about 3 inches below the level of the surface of the water in the boiler. The diameter of this chamber is $46\frac{1}{2}$ inches, and its height 6 inches. The hot air passes thence upwards to the top of the boiler, through the steam chamber, having a diameter equal to that of the boiler, and a height of 22 inches, by means of a cylindrical passage 13 inches in diameter, communicating directly with the smoke stack or chimney, of equal diameter. The top of the chimney is about $14\frac{1}{2}$ feet above the level of the Railway. The two steam cylinders stand upright, close to the boiler, are each 10 inches in diameter, and have a 20 inch stroke of piston. The power is communicated by means of connecting rods and two cranks to a shaft that carries a spur wheel 23 inches in diameter, which wheel drives a pinion 14 inches in diameter, on the axle of the forward road wheels of the engine, and causes these road wheels to advance upon the Railway two revolutions for each double stroke (i. e. once up and once down) of the pis-

tons. The diameter of all the road wheels is 35 inches, and the power is geared to one pair only. A fan wheel, propelled by the waste steam from the cylinders, is employed to create a blast to urge the fire and effect a combustion of the Anthracite coal, that being the fuel used.

The *Traveller* engine varies in point of construction from the Atlantic, having the pinion removed from the axle of the road wheels, and placed upon a separate axle or shaft posited about three feet forward from, parallel to, and in the same horizontal plane with, the front axle of the road wheels. The length of this shaft is the same with that of each of the two axles of the four road wheels, and it is furnished with a crank at each extremity, outside of the frame of the engine, as is likewise the two axles of the road wheels, so that by means of horizontal connecting rods, the shaft and the two axles revolve in unison, and thus the adhesion upon the Railway of all the four road wheels of the engine will be employed, when required. In case the load is such that the adhesion of one pair of wheels only is sufficient, one of the connections may be dispensed with, and the shaft will then be connected only with the axle of the forward pair of wheels. The power is communicated to the pinion on the shaft in the same manner as in the Atlantic, and as in that engine, each double stroke of the pistons effects two revolutions of the road wheels. The side pieces of the frame of the *Traveller* are plated with rolled iron; the bearing boxes work in slides; and the springs are placed above the boxes, and underneath the side pieces; arrangements that are superior to those of similar parts in the Atlantic engine.

The *Arabian* has a boiler similar to that of the Atlantic or the Traveller, already described, except in the number and dimension of the tubes, their arrangement with that of the upper part of the boiler, and a slight change in the dimensions of the latter. The diameter of the boiler is 52 inches, and the height 64 inches; diameter of fire place, 48 inches, and height 22 inches. The number of tubes is 400, with a diameter at the lower end of $1\frac{1}{4}$ inches, and at the upper end of 1 inch: length of tubes 31 inches, six or seven inches of which extend above the level of the water surface in the boiler. A part of the upper head of the boiler, 4 feet in diameter, is depressed 11 inches, at which level it receives the upper ends of the tubes, thus forming, as it were, within the steam chamber, a cylindrical hot air chamber, extending from the tubes to the top of the boiler, of the dimensions just indicated, and communicating directly with the smoke stack, which latter is enlarged near its base, and appropriately attached to the cylindrical sides of the hot air chamber. This attachment is such that the smoke stack can be removed at pleasure, upon which the upper ends of the tubes will be exposed to view, and being thus easily accessible, they can be taken out and replaced with new

tubes with the utmost facility, when repairs are required. An important improvement in the boiler, it is believed, has thus been effected in the Arabian engine. The diameter of the steam cylinders is 12 inches, and their depth, or length of stroke is 22 inches. The power is transmitted through similar gear to a separate shaft, and thence to all the road wheels of the engine, as in the Traveller. In the Traveller, the springs are underneath the side pieces of the frame, but in the Arabian, this fixture is improved, the springs being now placed above the frame, as in the English plan. The valve gear for reversing motion has likewise been advantageously modified in the Arabian, being now such that the effort applied to shift the cam frames from one cam to the other, operates simultaneously and alike upon both ends of the frame, effecting the object with more certainty and despatch. Improvements have, moreover, been made in the fastenings, connections, and rubbing parts of these machines, at once securing to the new engines, superior stability and duration.

Improvements of some value have also been matured and adopted having regard to the economy of steam. In the Arabian, the steam is conveyed to the working cylinders by passing it down inside the boiler, to the parts in contact with the cylinders, whence the steam is conveyed into the cylinders with the least loss from condensation. The waste steam, in its transmission from the cylinders to the fan-wheel, is made to pass in a hollow belt encircling the boiler, in which belt, the water pipes leading from the supply pumps, are enclosed and likewise make an entire circuit of the boiler, by which arrangement a portion of the heat of the waste steam is transferred to the water in the tubes, and with the water, is impelled into the boiler. The fan-wheel, upon the vanes of which the waste steam acts, is so contrived and fixed, that the whole or any part of such steam, at pleasure, can be made to propel the fan, thus enabling the attending engineer to control the blast, and by that means to regulate the heat of the fire, so as to generate the quantity of steam required by the emergency.

Hitherto, the successful combustion of Anthracite coal in locomotive engines has been attained only upon the Baltimore and Ohio Rail Road, in Cooper's tubular boiler, assisted by an artificial blast; and such a blast is made with the utmost economy, by means of the fan-wheel driven by the directly applied power of the waste steam, or the steam after it has performed its office as a prime mover within the cylinders. This manner of creating the blast, is an invention of Phineas Davis, to whom a patent has issued.

In relation to the adopted improvements in the boiler, it may be stated, that the comparatively inaccessible position of the tubes in the Traveller engine, would render their repair difficult, and as these repairs must become inevitable, a change in the tubular ar-

rangement giving more facility of approach, was desirable. The suggestion at first presented, went to an elongation of the tubes to the upper head of the boiler, a bold, and perhaps hazardous step, since so considerable a portion of their length would be above the water, and be surrounded only by steam. To attain the object of accessibility, and yet avoid the risk alluded to, determined the depressed position of that portion of the head of the boiler in which the tubes are inserted, and being of less diameter than before, passing through 24 inches of water, having only about 7 inches of their length above the plane of the water, and that enveloped in steam, sudden injury from intense heat is not experienced: much of the heat is parted with below the steam chamber, and within it the ebullition of the water acts as a further protection to the tubes.

Whilst the size of the fire place and the external dimensions in the boiler in the Arabian, differ immaterially from the corresponding parts of the Atlantic and Traveller engines, there has been a decided improvement in the external appearance generally, of the new engines, every part being now more tastefully formed and arranged. For these useful, and at the same time pleasing, yet not costly, embellishments of the engines, as well as of the coaches, we are much indebted to the talents and refined taste of John H. B. Latrobe, Esq.

The quantity of fire surface, or area exposed to radiant heat, in the Arabian, is about $30\frac{1}{2}$ square feet, and the area in the tubes in contact with the heated air that passes through them, is $304\frac{1}{2}$ square feet, amounting, in all, to 335 square feet of fire surface. With a boiler and fire place so arranged and furnished, the generation of steam is sufficiently rapid and voluminous to supply the cylinders, enlarged as they are, to 12 inches diameter, with a 22 inch stroke, at a pressure of 50 lbs. upon the circular inch, and for any velocity upon the road that will be convenient, as is evident from an experiment, in which this engine conveyed at the rate of $11\frac{7}{10}$ miles per hour, on a level part of the road, a train weighing, including cars, but excluding the weight of the engine and tender, 112 tons 18 cwt. 1 qr. the supply of steam being redundant, and pressure 50 lbs. to the circular inch. With this load, the engine advanced, but at a diminished speed, to the summit of 10 feet high in the deep cut, upon the railway ascending at the rate of 17 feet per mile; and curved with a radius rather less than 1000 feet.

The entire weight of the Arabian, with its complement of fuel and water in the boiler, is $7\frac{1}{2}$ tons; of which there rests upon the forward pair of wheels 3 tons 17 cwt., and upon the after pair 3 tons 13 cwt. The distribution of the weight is, therefore, judicious, and the engine will be less injurious to the railway than the Traveller, weighing 7 tons 11 cwt. 2 qrs., in which 4 tons 11 cwt. 3 qrs. are placed upon the forward wheels, and 2 tons 19 cwt. 3 qrs., upon the hinder wheels. It will be noticed, that

whilst the Arabian is of less weight than the Traveller, by only 1 cwt. 2 qrst, yet no one wheel of the Arabian, bears upon the railway with as much weight as a single wheel of the Traveller, by 7 cwt. 1 qr. 14 lbs. This equalization of weight upon all the wheels, is a manifest improvement in the Arabian, where the adhesion of the weight of the whole engine, can be employed in the traction: and it is believed that more than two tons weight should not be allowed to bear upon the rail through one wheel, however high may be the degree of perfection aimed at in the construction of the wheel or of the railway, whilst if either is less substantial, the weight should, if possible, be less than 2 tons, or not exceeding $1\frac{1}{2}$ tons.

The Arabian is beautiful in appearance, and excellent in performance, having a power of steam and of traction, leaving nothing further on that score to desire. This engine was put upon the road, for the first time, about the 14th of July last, and very soon a crank gave way from a flaw, until then unperceived; on the defect being repaired, the engine was directed to the service of daily leading the Frederick train of passenger coaches between this City and the planes at Parr's Ridge, a distance of about 41 miles, going and returning daily, making about 82 miles per day. In this work the Arabian was still employed, when I had the honor to submit my special report upon this engine, dated the 1st of September of the present year, in which it was stated that the engine had then performed upwards of 40 trips to and from plane No. 1, having run about 3500 miles with passenger trains without the loss of a trip, and without any repairs. In the same successful manner, were completed 51 trips, when in returning upon the 52d, and after running 4200 miles without any repair, the engine was thrown from the road upon the fracture of a flange caused by impingement against a stone. The Traveller engine was then placed in the line for a day or two, until the Mercury, an entirely new engine, was placed upon the road, when the latter superseded the former in this service. The Arabian was soon repaired and again placed upon the road.

From what has been related, it will appear that the Company have fully succeeded in procuring the construction, in this country, of locomotive steam engines fitted to use Anthracite coal as the fuel, and capable of plying successfully upon a railway having quickly turning curves, upon radii even so small as 400 feet; that these engines have all the power requisite upon railways, and that they appear to be substantial and durable. No further achievement in this branch might, therefore, seem practicable or even desirable. It is, however, believed, that a conclusion to this effect would be precipitate, if not erroneous. True, we can employ any of the usual kinds of fuel, wood, coal, coke, and do now use Anthracite alone; we generate a superabundance of steam; we have power in abundance, and have speed at com-

mand; the machinery is beautiful and works admirably; yet, have we not more steam, more power, a greater weight of engine, than is requisite for the conveyance of passengers? We have. The question, however, is, whether an engine of a weight no more than sufficient in point of *adhesion* for this purpose, and weighing only 6, or at the utmost $6\frac{1}{2}$ tons, can be constructed, having at the same time, sufficient strength and durability of parts, and a capacity to furnish steam enough to maintain a proper rate of speed. To ascertain this point, it is in contemplation, to plan an engine, geared as the Arabian is, but with parts diminished in size to the greatest extent consistent with the proper degrees of power. When this plan shall be perfected, with every reasonable prospect of success in the valuable qualities aimed at, a practical trial of it in the construction and use of an engine, will be recommended. Meanwhile, as engines of the description recently made, and in progress of construction, appear to be of excellent quality, and in the transit of commodities, will, from their great power of steam and adhesion, be most economical, no intention is entertained of recommending any relaxation in the business of their fabrication at present. At the same time, seeing a possibility that lighter engines may be made successful in the passenger service, and well knowing that such will be less injurious to the rails, and to the wheels, an anxiety is felt not to lose sight of the project of a more complete adaptation of the weight to the strength of the resisting materials.

Coaches for passengers have claimed the serious attention of the engineers and officers of this Company within the past year: and it has been found, on trial, that a coach upon eight wheels is easier, and every way more comfortable, to the passengers, cheaper in cost of construction and repairs, and less injurious to the Railway in proportion to the number of persons carried, the motion being more smooth and steady than those of four wheels. When eight wheels are employed, each end of the coach is supported by a frame having four wheels, the two pairs of which may be as near together as will permit the flanges of the wheels, two and two, to revolve without being in contact with each other. In this way each set of four wheels will traverse a curved road easier than when the axles are further apart, as they necessarily must be in a coach with only four wheels. The coach has strong side frames of wood, plated with iron, and rests with bolsters upon the wheel frames, to which it is attached by means of a *rose* or centre bolt, permitting each set of wheels to assume, independent of the other, any direction the road may require. These coaches may have apartments to contain from 8 to 12 persons each, whilst the number of apartments in a coach may be 3, 4, or even 5. Coaches with eight wheels will be safer from accident, it is believed, than with four wheels; in fact, they are much more

convenient and appropriate, in all respects, for Railway conveyance; and this kind of coach has accordingly been adopted.

Steel springs are still being placed upon the burthen cars as well as upon the coaches, and with evident economy in every respect.

Wheels of cast iron upon the cars of burthen, as well as upon the coaches, have stood the test of experience, and have come up to our most sanguine expectations. This description of road wheels has, in a word, been entirely successful. The method of completing the chilling process by means of the introduction of a malleable iron ring into the casting, mentioned in the last annual report as invented by Phineas Davis, has been successful. At first the ring was found to have been placed too near the face of the wheel, and the consequence was, that the thinness of the chilled metal caused it to give way from the action upon the iron rail. To remedy this defect, the ring was made of rather smaller wire, and in casting, was removed further from the face of the wheel; this modification proved altogether successful, and the most economical wheel possible for Rail Roads has thus been perfected. The wheels for burthen cars and for coaches are cast in the same chill, and are 30 inches in diameter, with 12 arms. The ring is of round wire half an inch in diameter, and it does not approach nearer to the face of the wheel than half an inch. The wheel of the burthen car weighs 222 lbs., and of the passenger coach 260 lbs. In the cast iron wheel of three feet diameter, for the locomotive engine, the size and position of the malleable ring has not yet been satisfactorily determined. In the wheels of this kind last put in use, and within a few days past, the ring is of less thickness than previously used, being reduced from $\frac{7}{8}$ to $\frac{3}{4}$ of an inch, at the same time that it has been placed further from the flange, and $\frac{1}{4}$ of an inch further from the face of the wheel, being now $\frac{3}{4}$ instead of $\frac{1}{2}$ an inch from the exterior of the rim. It was found that with the larger ring lying under the coned part, next to the base of the flange, having the chilled metal only $\frac{1}{2}$ an inch in thickness, immediately over the ring, the rim cracked and by degrees gave way to the great injury of the wheel, and in one instance so weakened it, that, upon striking a stone, the flange gave way. This was the casualty in which the Arabian engine was thrown from the road, as already mentioned. Previous to this occurrence, symptoms of defect in the face of those wheels had been observed, and was attributed to the true cause, being the same as had been effectually remedied in the wheels of the cars and coaches, and engine wheels were immediately cast, containing a ring of smaller diameter placed further from the face of the wheel and from the flange. It is believed, that this arrangement and change of size of the ring, will obviate the recurrence of the defect that had been experienced. Other and further precautions, however, to strengthen and ren-

der more durable the engine wheels, have been matured and will be adopted in all future castings of them, and it is not doubted that the cast iron wheel of not more than 36 inches diameter can be made secure, and safely used upon the engines, as has that description of wheel, 30 inches in diameter, been most successfully, upon the cars and coaches. Nor will the duration of the cast wheel, be less than was estimated in my Report upon the Washington Lateral Rail Road. I am happy, further to add in this place, my conviction that the estimates for the construction of that road, and for the cost of the motive power and machinery upon it will not be transcended.

Patterns for the cast iron fastenings of the rails, and for the turn-outs upon the lateral road, are in progress of completion under the immediate care of the assistant engineer of machinery, Ross Winans, with whose assistance, these fixtures, and the form of the rail, have been matured. The turn-outs will be such as are best calculated to facilitate the passing of locomotive engines.

As regards the business of transit and of revenue within the year, upon the Baltimore and Ohio Rail Road, I refer to the Report which will be made by the able and very vigilant superintendent of transportation, William Woodville.

Respectfully submitted,

J. KNIGHT,
Chief Engineer B. and O. Rail Road.

[B.]

*Office of the Superintendent of
Machinery, Oct, 1st. 1834. }*

TO PHILIP E. THOMAS,

President of the Balt. & Ohio Rail Road Co.

In accordance with the rules and regulations for the government of the officers and agents of this Company, I now respectfully submit the following Report of the operations of the department of Machinery, for the year ending on the first day of the present month.

The subjects that engage the attention of this department are every day assuming a deeper interest. There is, perhaps, a point in the improvement of the construction of machinery, beyond which human ingenuity cannot reach, but no man, at this time, can designate that point. In the other departments connected with the general system of Rail Roads, there is a degree of perfection which cannot be passed, and every one can perceive it. In the graduation, the straight line without curvatures, without elevations or depressions, is not only conceivable, but if means adequate to the accomplishment of the object, by bridging rivers, cutting through hills, or tunnelling mountains and filling up valleys, be applied, it is perfectly practicable. But in the construction of machinery the case is very different. Here improvements are every day taking place, not by the discovery of new mechanical powers, but by new, and seemingly endless, combinations of them. The application of these powers and principles are in fact so varied, and so complicated, that no mechanical attainment has sufficiently penetrated the arcana of science, to fix their ulterior limits, and say, thus far shall invention advance, and no farther. There is then, a boundless field open to the machinist. Many discoveries have been already made by bold and ingenious adventurers. Much has been done in the last and present century, and advances have been made, which 60 or 80 years ago would have been deemed chimerical. To say nothing of the improvements in chemistry and the co-relative arts, nor of the endless variety of machinery employed in manufactures, the application of the power of steam, and the various and important uses to which it has been rendered subservient, from the ponderous and capacious steam boat to the smallest engine substituted for animal or water power, challenges the wonder of the ignorant, elicits the congratulation of the learned and of the friends of science, and excites the emulation of mechanicians

to make still further discoveries in a field that is yet inexhausted, and so far as appears, is inexhaustible.

The locomotive engine dates its birth but a few years back, yet young as it is, it has already acquired much of the vigour and activity of adolescence; what may not then be expected when it shall have attained to the steady, firm untiring step of mature age. The voice of experience even on the Baltimore and Ohio Rail Road proclaims that great advances have been attained in the construction of locomotives from the first efforts made by the Company, as well as by others who at their own expense and risk, entered the field of competition.

Although the Rail Road system originated in England, yet it was very evident that the best constructed machinery in use there was exceedingly defective, and that unless several material improvements could be effected in the parts most liable to wear, and also in the construction of locomotive engines, the expense arising from repairs and renewals would seriously affect the success of the Rail Road here. Our attention, therefore, was from the first especially directed to the improvement of this all important branch of the system and our progress has been considerable, in every particular. A great reduction of friction, as well as of the consumption of oil, has been attained, and a degree of permanence given to the road wheels, which has, it is believed, never heretofore been effected. Some of these have traversed a course of about 24,000 miles without exhibiting evidence of being preceptibly impaired. This permanence is owing to an increase in their weight, and to the introduction of a strong wrought iron ring into the interior of the rims of the wheel, and a more perfect chilling or case hardening of its periphery, especially the conical part of it.

In the year 1830, Peter Cooper, Esq. illustrated by an experiment with a small working locomotive engine, with a tubular boiler, the practicability of using Anthracite coal as fuel. Subsequently, Phineas Davis, in conjunction with the engineers and machinists of this Company, has, by a series of experiments, introduced several essential improvements, resulting in a triumphant success and in the construction of locomotive engines of great power, strength and durability. Several of these have been put in operation upon the Baltimore and Ohio Rail Road, and their performance has exceeded the expectation of the most sanguine, being decidedly greater than that of any other engine of similar weight yet known. Anthracite coal is exclusively used as fuel, being not only more economical, but is found to emit neither smoke nor burning particles, so annoying to passengers, and so universally complained of in the engines of the usual construction.

In several particulars these engines differ essentially from those heretofore in use. They are more compact, and have a greater fire surface in a more limited space—the powerful fanning appa-

ratus impelled by the waste steam, pouring a constant and impetuous stream of air through the furnace, and always ensuring the combustion of the Anthracite coal—the ingenious contrivance by which the waste steam is applied to heat the water in its passage from the supply pipe to the boiler, and the manner of protecting the principal part of the machinery from the irregular action of the road wheels, constitute, together, striking features in this admirable specimen of American invention and ingenuity.

The workmanship in all the engines recently constructed at the manufactory of the Company, exhibits considerable improvement, the materials of which they are composed are of the first quality, and all the principal points subject to wear have been rendered more permanent by case hardening.

As an evidence of the durability of these improvements, the Arabian locomotive engine continued to run 50 days between this city and the Inclined Planes, a distance of 82 miles daily, making 4,100 miles, without requiring repairs or showing any perceptible wear or deterioration.

As the ultimate success of the enterprise mainly depended upon the employment of engines adapted to the curvatures of the road, and to the use of Anthracite coal, and of such a permanent construction as would not require frequent repairs, it cannot fail to excite the highest gratification in the friends of the measure that so signal a triumph has been achieved, in the production of those machines, possessing these properties in so eminent a degree.

The machinery now on the road, and in active use, is as follows:

Locomotives.

1st. The Atlantic, now undergoing an alteration which will render her equal in power to the other engines more recently built,

2d. The Traveller, employed in the transportation between the Mount Clare depot and Ellicotts' Mills, of passengers and of goods.

3d. The Arabian, which continued for 50 days in succession to run from the depot to the Plains with the Frederick train of passenger cars, the daily expense being as follows:

Coal, $1\frac{1}{4}$ tons, at \$6 per ton,	\$7 50
Engineer,	2 00
Assistant do,	1 50
Oil,	50
Interest on cost,	75
Contingencies,	1 00
	<hr/>
	\$13 25

To this it will be safe to add three dollars per day for repairs that may become necessary to maintain the engine in good order.

4th. The Mercury, of the same power as the Arabian, has been running 20 days at the same daily expense as stated above.

The above mentioned four engines were built by Phineas Davis, who, from his first effort in constructing the York, to the full attainment of the Herculean powers of the Arabian and Mercury, has made rapid advances in perfecting these machines, affording encouraging prospects of still farther improvements. As far as the experiment has been made, the cost of transportation is lessened, and it has already been ascertained that when steam power shall be so far employed as to enable us to dispense with horse power, the balance will be found materially to preponderate in favour of the former.

Four new passenger cars have been constructed during the present year, viz.

- 1st. The Winchester, carrying 36 passengers, on 8 wheels.
- 2d. The Dromedary, a large and commodious car, 8 wheels.
- 3d. The Comet, a car with 5 bodies, carrying 40 passengers, 8 wheels.
- 4th. The Patterson, on 4 wheels.

Four of the old cars have been repaired, and placed upon 8 wheels.

All the other cars are in a respectable state of repair, and will probably do service through the ensuing winter, with but little additional expense.

The number of burden cars now in the service of the Baltimore and Ohio Rail Road Company is 1,000, exclusive of 27 employed on the Washington road.

The passenger cars hitherto in use on this road generally resembled, in many respects, the usual stage coaches—most of those built within the present year are materially different from them in appearance and arrangement—the bodies are long, and supported on 8 wheels, which are so placed as to pass the curvatures of the road with greater facility than the ordinary kind of car. These are not only more commodious, but they afford additional security to the passengers; they are simple in construction, and very strong, and consequently will seldom require any repairs, by which a great saving will be effected. During the time these carriages have been in use, several further improvements have been suggested, and a plan is now adopted, which it is thought, when introduced, will be very safe and commodious, and meet the public approbation.

The total number of passenger cars now in the road is 34.

The ten passenger carriages ordered to be built for the Washington Rail Road, and which, when completed, will convey up-

wards of 350 passengers comfortably, are now under construction, and will be ready for service, as will also the four new locomotive engines intended for that road, by the time it is finished.

In relation to the duration of wheels, it may be stated that the those with metal rings in them upon the following named passenger coaches, have performed, as underneath, whilst several of the same wheels present but little appearance of deterioration, viz:

			<i>Miles.</i>
The coach President,	309 days, 82 miles per day,		25,338
" Virginia,	300 do. " "		24,600
" Alleghany,	290 do. " "		23,780
" Shenandoah,	259 do. " "		21,238
" United States,	240 do. " "		19,680
" Pioneer,	220 do. " "		18,040
" Maryland,	240 do. " "		18,450
			<hr/>
			7)151,126
			<hr/>
Average,			21,569
			<hr/>

Respectfully submitted,

GEORGE GILLINGHAM,

*Supt. of Machinery,
B. & O. R. R.*

[C.]

*Office of the Superintendent of Transportation, }
B. & O. R. R. Co. Oct. 1st, 1834. }*

PHILIP E. THOMAS,

President.

SIR,—I have the honor to submit to you the returns of the operations on the Baltimore and Ohio Rail Road, for the year terminating on the 1st October.

It will be seen on reference to these Documents, marked C, No. 1 to 6 that the receipts have been,—for Passengers, \$89,181.79, and for Tonnage, \$116,254.79, making together, for the year, the sum of \$205,436.58.

It will also be seen that, during the same period, the expenses of transportation and of the repairs of the Railway and of the machinery, have been \$132,862.41.—Detailed statements of the items composing these several sums will be found on referring to the tabular statement marked No. 4.

On comparing the aggregates of the last year with those of the preceding, the following results will be deduced, viz.

	Receipts.	Expenses.	Net Revenue.
1833,	\$195,679.72	\$138,484.36	\$57,195.36
1834,	205,436.58	132,862.41	72,574.17
	<hr/>	<hr/>	<hr/>
Difference,	\$9,756.86	\$5,621.95	\$15,378.81
	<hr/>	<hr/>	<hr/>

Being an increase in the receipt of last year over those of the preceding of \$9,756.86, and a diminution in the expenses of \$5,621.95. The net revenue of the year is \$72,574.17, whilst that of 1833 was only \$57,195.36, there has consequently been an increase of \$15,378.81.

Attention will naturally be attracted to the small amount of net revenue remaining, after paying all the expenses connected with the working of the road. This subject it has heretofore been attempted to explain, but as it is a question of deep interest to the stockholders it may be proper to submit the matter in detail.

The gross receipts, it has been shewn, are \$205,436.58, whilst the net revenue is only \$72,574.17. In comparing these returns with those of many other Rail Roads now in operation, the result will apparently be highly unfavorable to this work.

In making such comparison, however, it is important to advert to the different characters and functions of those Rail Roads relatively to this.

It will be recollected that, in their case, the tolls have, in every instance, been *much higher than those charged on the Baltimore and Ohio Rail Road*;—those Railways have generally been constructed on the lines of great and well established thoroughfares for the conveyance of passengers and goods, but more generally for the former;—they are, with few exceptions, short, and as they are not, therefore, burdened with numerous agencies, their incidental expenses are consequently limited;—and, having been completed to their proposed extent, their receipts would at once realize their original estimates, by the simple transfer to them of the trade already existing, but passing through less commodious channels.

In the case of this work its results are heretofore only imperfectly developed;—it has advanced only a short distance towards its ultimate destination, and has scarcely yet participated in any portion of that commerce for which it was especially instituted;—its trade is derived, almost exclusively, from the business of the country, with which, in its present extent, it is locally connected, —and although this has become very considerable, it is necessarily procured at numerous points on the line of the road, at most of which, depots and agencies have unavoidably been established.—This liberal diffusion of facilities, at whatever places the public convenience has required them; has connected the Company, over a great space of Railway within the City of Baltimore, and at several points on the line of the road, with heavy responsibilities, in relation to the receiving and delivery of goods; and has consequently rendered suitable agencies at such places indispensable:—and when, also, the fact is adverted to, that, at each of these points, the same extent of responsibilities and minuteness of details are incurred by this Company, that are usually rendered by private forwarding houses, it will be readily conceded that the single branch of the service alluded to cannot be conducted without a competent, efficient, and consequently an expensive agency.

Under the circumstances in which this work is thus placed, of providing for and adapting itself to the general demands of the community, it may be confidently asserted that the numerous sources of expenses with which it is charged cannot, whilst its efficiency and usefulness are maintained, be either curtailed in number or in amount:—and, although this may be a disadvantage in relation to a limited business, it is satisfactory to know that, in several very heavy items, these expenses would remain without any increase under a great accession to the business of the road.

As the subject of the expenses of this work is one of deep interest, not only to the stockholders, but as affecting also the efficiency and economy of the Rail Road system itself, relatively to other modes of transportation,—it may be proper, therefore, in the following exhibit, to submit clearly the data on which the as-

sertion has been made that a large portion of the expenses of the Company would remain without any increase under a very considerable augmentation of their receipts.

The general expenditures of the Company resolve themselves into two classes:—the one not being affected either by a diminution of the commerce of the road or by its increase to a considerable extent,—and, consisting of the maintenance of the Rail way,—the support of depots, pay of agents, &c.—may be called the *fixed expenses*:—the other, being governed in its amount by the actual transportation,—rising or falling relatively to the extent of such transportation, and embracing the cost of moving power and the repairs of vehicles, &c. may be considered as *floating expenses*.

Under the first denomination,—that of *fixed expenses*,—may be classed:—

1st. The maintenance and repairs of the Rail Road and the support of the police of the road:—this portion of the expenditures being caused by the cost of removing slips, or opening ditches, drains, &c.—the adjustment of the rails deranged by settling,—by the removal of defective materials from the Railway,—and arising, generally, from causes unconnected with the number of carriages which may pass over the road, and not being consequently affected by its amount of business,—have been considered as *fixed*.

2nd. The pay of officers, agents and conductors.—The individuals thus receiving pay from the Company, as before stated, cannot be reduced, being absolutely required at the depots that have been established;—yet a much greater amount of business could be effected by them without any increase of their number,—and it would not be hazarding an assertion, rashly, to state that if the business of the road, in its present extent, were augmented three fold, these charges could remain without any increase:—for the purposes of this exhibit they may, therefore, be assumed, as *fixed*.

3rd. Depot expenses and contingencies,—expenses of stations, &c. These items are precisely similar in their character to the preceding—as although their number cannot be reduced, yet they are adequate in their present extent, to the demands of a more extended commerce.

The aggregate outlay on these several accounts has been—viz:—

Repairs of Railways, &c.	\$22,795.90
Pay of Superintendent, Agents and Conductors,	13,453.20
Depot and Station expenses, Contingencies, &c.	16,135.23
Total of <i>fixed expenses</i> ,	<u>\$52,384.33</u>

Under the second class of disbursements, that of *floating expenses*, are embraced:—

1st. The cost of moving power—that is the feed, wear and tear, and general attendance on the horses and mules employed on the road,—the pay of their drivers, &c.

2nd. The use of locomotives, their fuel, and the pay of engineers and repairs of the engines, the repairs of wagons and carriages,—and contingencies.

These items have amounted to—viz:—

Moving Power and wear and tear of Horses,	64,428.31
Use of Locomotives, &c—and the repairs of Cars,	
Contingencies, &c.	16,049.77
	<hr/>
Total of <i>floating expenses</i> ,	\$80,478.08
	<hr/> <hr/>

The general expenses are thus subdivided and classed as follows—viz:—

Fixed Expenses,	-	\$52,384.33
Floating Expenses,	-	80,478.08
		<hr/>
Total Expenses,		\$132,862.41

The results, therefore, which may be deduced from this analysis are the following—

1. The actual Receipts have been	-	-	\$205,436.58
The Expenses have been,—viz:			
Fixed,	-	-	\$52,384.33
Floating,	-	-	80,478.08
			<hr/>
			132,862.41
			<hr/>
The Net Revenue,			\$72,474.17
			<hr/> <hr/>

2. Had the Receipts been doubled the following result would have been obtained:—

Actual Receipts,	\$205,436.58	$\times 2 =$	-	\$410,873.16
Expenses, viz:—				
Fixed,	-	-	\$52,384.33	
Floating,	\$80,478.08	$\times 2 =$	160,956.16	
			<hr/>	213,340.49
				<hr/>
Net Revenue would be				\$197,532.67
				<hr/> <hr/>

3. Again,—the assertion has been made that had the receipts been three fold as great as those collected on the road, yet on the prin-

ciple alluded to, the following results would have been presented,—viz:—

Actual Receipts, \$205,436.58 $\times 3 =$ \$616,309.74
Expenses, viz:—

Fixed, - - - \$52,384.33

Floating, \$80,478.08 $\times 3 =$ 241,434.24

293,818.57

Net Revenue will be \$322,491.17

Or, to apportion these expenses between the passenger and tonnage business, as stated in Table C, No. 4, the following exhibit would appear,—viz:—

Expenses.	Passengers.		Tonnage.		Total.
	Fixed.	Floating.	Fixed.	Floating.	
FIXED—viz.					
Repairs of Rail Road, &c. -	\$11,397 95		\$11,397 95		\$22,795 90
Pay of Officers, Agents, and Superintendent, - -	5,538 98		7,914 22		13,453 20
Depot Expenses, Contingencies, Supervisors and stations on Road, -	6,611 78		9,523 45		16,135 23
FLOATING—viz.					
Moving Power, and wear and tear of Live Stock, - -		25,831 83		38,576 48	64,428 31
Repairs of Wagons, Carriages, use of Engines, &c. - -		\$9,715 36		6,334 41	16,049 77
	\$23,548 71	\$35,567 19	\$38,885 62	\$44,910 89	\$132,862 41

Thus, although with the present limited business of the Company, the net revenue has only been \$72,574.17, yet if the road possessed a commerce of three times its actual extent, instead of its net revenue advancing only in a direct ratio,—or to \$217,722.51, it would, from the causes stated, be increased to \$322,491.17.

The experience of the Company presents ample confirmation, in the monthly returns of the receipts, of the correctness of the data from which these hypothetical statements have been deduced,—and, in the analysis of the expenditures incurred in any two months of the past year,—where the two extremes of revenue from tonnage presented themselves;—viz. in July, when it was only \$6,906.26,—and in September, when it amounted to \$11,944.99, the principle alluded to has been fully sustained.

In taking a prospective view of the operations of this Company it may be assumed generally from the experience obtained that the net revenue will always advance in a greater ratio than the gross receipts, and that although that portion of the expenditure which, for distinction, has been denominated fixed expenses will in some of its items, after a certain accession of business,

be slightly increased, yet such increase will form a very unimportant addition to the general amount,—or affect in a very trifling degree the principle it has been sought to elucidate.

The Western Trade.

This Company have now had the benefit of an experience, derived from active and uninterrupted operations for a period of nearly three years, on a line exceeding sixty miles in extent.

The transportation they have effected, during this time, has been of the most varied and general character, embracing commodities of the most cumbrous and ponderous descriptions known in commerce:—among them may be daily remarked blocks of granite weighing several tons each,—logs of timber of from fifty to seventy feet in length,—machinery of the most unwieldy forms,—considerable numbers of live stock,—as well as every imaginable variety of produce and merchandize:—these may frequently be all seen on the Railway, collected into a single train, and all moving with equal facility and despatch. The question of the adaptation, therefore, of the Rail Road system to the purposes of a general commerce may certainly, by the daily proof thus afforded, be considered as settled.

On the portion of road now described there is a recurrence of all the impediments and disadvantages which would be found to exist on the extension of the work to the Ohio River.—Its line, throughout these sixty miles, is excessively curved,—its grade is undulating;—and it has a succession of inclined planes to surmount;—it, therefore, may be presumed to present, within this space, as many causes of expense and of delay as would be found to exist on a continuous line to that river;—it may be questioned whether it does not exhibit more:—for, although a Railway across the ridge of the Alleghany mountains would have a more extensive series of inclined planes, yet, as these would only occur in one instance on a road of nearly 300 miles in length, they would therefore have, relatively to their extent, a greater proportional length of level Railway than exists in reference to the planes now worked at Parr's ridge.

It may, therefore, be assumed that statements, based on the facts just adduced, will be applicable to the prospective operations, on a continuous Railway to the Ohio River.

The line of road now in use on which the transit is daily effected in both directions, extends to the Point of Rocks, a distance of sixty nine and a half miles.—Animal Power having been heretofore alone used on this road for tonnage—the transit between Baltimore and that place is effected in twenty four hours:—that is to say:—goods are received daily at the depots of the Company in Baltimore from individuals, until twelve o'clock at noon, and are immediately loaded and conveyed to the Point of

Rocks,—where they arrive at the same hour of the following day.

The price for which this conveyance is effected is, westwardly, six cents;—and, eastwardly, four cents per ton per mile, (of 2240 lbs.)

Without, at this time, pausing to advert to the vastly superior speed that will be obtained, on the substitution, in this branch of the business, of steam for horses;—and, without basing any calculations on its greater economy as a moving power,—it would appear, from the data deduced from the daily operations of the Company, that—the distance between the nearest point of the Ohio river and Baltimore being estimated at 310 miles,—the transit would be effected in a little over four days:—that is to say,—goods forwarded from Baltimore would be delivered early on the fifth day on the Ohio—and *vice versa*. And this service would be rendered, even at the highest rates permitted by law to this Company, and including all their charges, for the following prices—viz:

			cts.
Westwardly,—from Baltimore to the Ohio, per 100 lbs. for			84 $\frac{1}{3}$
Eastwardly,—from the Ohio to Baltimore, do. do.			56 $\frac{2}{3}$

It is an encouraging fact, and one of great value to this work, that, low as these rates appear to be, they will, whenever it shall have reached a point which will afford more business to the road, admit of an extensive reduction. This consideration is the more important, as it will enable this Company to compete successfully with other modes of conveyance—or to reduce their prices, either to increase the traffic of the road, or to promote the western commerce of the city.

In order to ascertain how far this work may be enabled to realize all those important results, it may be proper to shew the actual cost to the Company of transportation on the road, deduced from the experience and facts they possess from the operations of last year.

It will be perceived by reference to table No. 2, appended to this Report, that the tonnage transported in both directions has consisted of 56,120.17.3.3 tons, and has produced a revenue of \$116,254.79, this tonnage having paid for its conveyance a medium rate of about 4 $\frac{2}{3}$ cents* per ton per mile—therefore the whole amount conveyed is equal to 2,491,174 tons for one mile;

	Tons.		cts.	
Viz.	2,491,174	×	4 $\frac{2}{3}$	= \$116,254.79

* This rate is deduced from the average of the two amounts received for tonnage transported in the two directions—(see Table C, No. 2,)—viz. that eastwardly having paid four cents per ton per mile—and that westwardly six cents.—The precise rate will be found to be, cents 4.6437.

or it is equal to 35,844.23 tons conveyed the whole distance between Baltimore and the Point of Rocks—viz.

Tons.		Miles.		cts. pr.	
35,844.23	×	69½	×	4½	= \$116,254.79

The cost of this conveyance has been shewn by the table in page 38 to be divided into two heads of expenses:—one, the floating expenses consisting principally of moving power and repairs of Machinery, and advancing or receding in the direct ratio of the Tonnage transported—this particular item amounted on Tonnage by that table to \$44,910 89, or to 1½ cents per Ton per mile,—viz:—

Tons.		Miles.		Cents.	
35,844.23	×	69½	×	1.8028	= \$44,910.89

The other division of the expenses of transportation denominated, from their remaining stationary under considerable terms of increase of revenue, the *fixed expenses*, amounted to \$28,835.62.

It has also been shewn that if the business of the Road were enhanced to a threefold amount,—and with slight modifications this limit might have been extended much farther—yet that these particular expenses would not be increased by such improvement:—and that, consequently, if the present local Tonnage of 35844 Tons were augmented threefold,—and it cannot but be considered as a very moderate estimate, when it is recollected that reference is had to the Ohio trade, the fixed expenses would then be only .385837 cent per ton per mile,—viz:—

Tons.		Tons.
35,844.23	×	3 = 107,532.99

Tons.		Miles.		Cents.	
107,532.69	×	69½	×	.385837	\$28,835.62

this sum being the amount of those expenses last year:—in other words, with a yearly transportation of 107,532 Tons.

the ratio of the entire expenses would be

viz:—

		Cents.
Floating expenses—*	say	1.8
Fixed do	“	.386

Total expenses of Transportation 2.186 per ton per mile—

Thus the whole expense incurred by this Company in the transportation of Goods and Produce between the City of Baltimore and the Ohio River, under all the tardiness and costs incident to *animal Power*, would be rather less than 2½ cents per ton—viz:

Ton.		Cents.		Miles.	
1	×	2.186	×	310	= \$6.78
or per 100 lbs.					30½ cents—

*The unimportant decimals have been here excluded.

At the rates now changed, the transportation, Eastwardly, from
 the Ohio, per 100 lbs. would be $56\frac{2}{3}$
 and Westwardly it would be do do $84\frac{1}{3}$
2)141

	Average,	$70\frac{1}{2}$
The expenses being		$30\frac{1}{2}$

The Net Revenue would therefore be per 100 lb. 40 cents.

As the great object of the institution of this work was to offer to the commerce of the West a rapid, uninterrupted and cheap means of conveyance to the Baltimore market, and, as this traffic is already in possession of other improved avenues to the Atlantic, it is a matter of the highest importance to know the extent to which a reduction in the rates on this road could be made to meet, either the exigencies of trade, or the competition of other lines of communication;—and, in making such estimate, the fact will be kept in view that in every instance where the Tolls have been lowered on other works, instead of a diminution of income, they have invariably, by the great accession of business the measure has produced, had an augmentation in their *Net* Revenues; similar effects would result from the same proceeding in relation to this Rail Road, and, as under the circumstances just stated $56\frac{2}{3}$ per cent of the gross receipts on Tonnage,—or 40 cents for each 100 lbs. conveyed,—is net income,—such portion of this sum, therefore, could be surrendered as events might render expedient or necessary:—for instance,—if a reduction were made of 25 per cent on the Toll and Transportation, the charge would then be—viz:

Cents.		
$70\frac{1}{2}$ less 25 per cent	=	53 cents.
Expenses as stated above	=	$30\frac{1}{2}$
		<hr/>
Net Revenue for each 100 lbs.		$22\frac{1}{2}$

That is to say, the average price of 53 cents for the two directions would resolve itself into the two rates of charge of—

Westwardly 63 cents per 100—from Baltimore to the Ohio &
 Eastwardly 42 do do —from the Ohio to Baltimore:—
 or for each Barrel of Flour conveyed from the Ohio to Baltimore, the freight would be rather less than 92 cents.

That this Company with an ample business on their Road could with great facility, and with positive advantage to themselves as well as to the community, reduce their rates to this extent or even more, can scarcely be doubted.

There is, however, another consideration which is entitled to great weight in this question, and which affords to Rail Roads generally, the means of meeting or resisting competition, from other modes of Transportation, in a pre-eminent degree:—it is the certain and unfailing resource they possess in the conveyance of passen-

gers. This description of business is benefitted in its net profits, even more rapidly than Tonnage, by an increase in its amount. This will be readily conceded when it is observed that a locomotive Engine will carry upwards of two hundred persons at the same cost that is incurred to convey any less number;—any measures therefore, that may add to the commerce on the Road, must also necessarily augment the number of persons travelling in connection with such commerce:—and whatever sacrifice of their Revenue from Tonnage the company might find it expedient to make, in order to promote or protect any of the great interests connected with this work, they would from the enlarged business that must ensue from that measure be more than indemnified in the increased receipts they would derive from Passengers.

Application of Steam.

As a matter of the highest interest to the Company, during the last season, may be noted the successful use and permanent introduction of Steam on the Railway.

On the 13th July, Messrs. Davis & Gartner completed and placed upon the Road a new Engine called the “Arabian”—after a few days of defective performance occasioned by unsuitable fuel and other embarrassments,—arising principally from the newness of the machinery,—this Engine performed regularly and with great accuracy the daily round of duty of 80 miles with the Passenger Train to and from the Planes to Baltimore.

Since that period a second Engine has been received from the same factory, which is also now undergoing a similar trial to that described in reference to the Arabian, and it is performing it with equal success.

The satisfactory manner in which these Engines have worked has realized the most sanguine expectations formed of their economy and efficiency; and although necessarily limited from prudential considerations to a moderate rate of travelling, by the curvatures of that portion of the Road on which they ply, they evidently possess the power of exerting a very superior speed.

In the routine of operations in which these Engines have been engaged they have each performed the same service that it had previously required 49 horses to effect. This, however, is not to be considered as the extent of their efficiency; it is merely the limit to which the particular business on which they have been employed has required their power, as instances have occurred in which the services of a single Engine have during the day represented the work of 113 horses.

The question of the economy of Steam power has been long so conclusively settled that it would be superfluous, if it were practicable, to add any new remarks on this head:—there is one particular, however, connected with a subject already alluded to in this report, in which its efficiency will have a most beneficial effect on this

work—and by which will be added another proof to those already adduced of the disadvantages and high relative cost of transacting a small business on a Rail Road.

The Engines, it has been stated, have daily been employed in transporting the Frederick Train 80 miles. This Train has generally consisted of from 50 to 70 passengers: sometimes, but very rarely, 100—the result of this operation has been, viz:

Passengers.		Miles.		Rate cents per.		
50	×	80	×	3	=	\$120
Expenses of Locomotive, 1 day, say						20
Net Amount,						<u>\$100</u>

Each Engine could, however, with equal facility have conveyed 200 or 250 persons, and if the business of the Road were sufficiently advanced to require its service to that extent, it would be effected at the same cost;—the result would then be as follows:—viz:

Passengers.		Miles.		Rate cents.		
200	×	80	×	3	=	\$480
Expense of Locomotive 1 day,						20
Net Amount,						<u>\$460</u>

Thus with precisely the same outlay of expenses of every description,—with the single exception of the wear and tear of the additional carriages that would be required—the net profit of a day's work of the Engine with a full business would be \$460

Whilst with the present limited business it is only \$100

Repairs of the Railway and maintenance of the Police of the Road.

The duty of superintending the condition of the Rail Road and of effecting the necessary repairs, having been incorporated with the department of Transportation, it is requisite that, in this report, a statement should be presented of the cost of that service.

It will be perceived that the aggregate expenditures incurred under this head have been 22,795.90 being 8,757.14 less than during the preceding year—these disbursements have been made for the following items,—viz:

Repair and adjustment of Stone track,	-	\$5,960.41
do. do. do. Wood do.	-	5,436.67½
Removal of Slips, cleaning ditches, drains, &c.	-	6,857.46
Repair of Horse track,	-	2,081.33
Contingencies,	-	2,460.02½

Total for the year,	\$22,795 90
---------------------	-------------

Reductions have from time to time been made in the number of supervisors employed in this department, until from seven they have been diminished to three;—beyond this, it is believed, no reduction can be effected. Each of these agents has the supervision of upwards of 20 miles of road, and as they are charged, also, during the winter, with keeping the track free from snow, and in order for uninterrupted travel, it is important that this branch of the service be not too much weakened.—It is due to these officers to acknowledge the alacrity and success with which this important duty has, in every instance, been discharged by them; and, that although this road has now been in operation for nearly three years, the transit has been effected throughout the entire line in both directions, without the interruption of a single day, during the whole of this period.

General operations of the year.

It has been shewn that the receipts of this year have been advanced over those of the preceding to the amount of \$9,756.86, whilst the general expenses have been diminished \$5,621.95. —This state of the business, although relatively favorable, presents, nevertheless, but an imperfect view of the improvement that has actually taken place in the general commerce of the road, —or rather in the extent of country and population to which it has become the means of intercommunication:—for, in common with all public works, the Rail Road, for several months of the past year, participated in the general depression of trade, and experienced a very great diminution of the tonnage and passengers of its previously existing lines of conveyance. The increase which has, therefore, actually taken place in its receipts, will establish the fact of the more extended range of its recent operations;—and, as it has arisen from several new and important channels of business which have successively become connected with this work, the Company cannot fail during the next year to feel their influence on the revenue.

The Rail Road having received, for some time, through the lateral Road to the City of Frederick, a full portion of the business that can at present flow from that quarter,—it is a matter of deep interest that the main stem of this road should, as rapidly as possible, be connected intimately with the commerce of the Potomac and Shenandoah, as it is through these channels, aided by the public works now being made in connexion with them, that the future accessions of Revenue will be received;—and it may be stated, as a proof of the progress the business has recently made in this quarter, that by comparing the receipts of flour at the Point of Rocks depot on the Potomac, for the six weeks immediately preceding the 1st of October of this year with the same period of last, it will be found that, in this short space,

there has been a gain in the present year of 9,204 Barrels,
viz.—

Received at the Point of Rocks depot,	
from 20th August to 30th September, 1833,	1,417 barrels.
“ do. do. 1834,	10,621

Gain in 1834,	<u>9,204 barrels.</u>
---------------	-----------------------

Respectfully submitted,

W. WOODVILLE,
Superintendent,
B. & O. R. R.

Statement of the Revenue received for the transportation of Passengers on the Baltimore and Ohio Rail Road, from the undermentioned places, respectively, from the 1st of October, 1833, to the 30th of September, 1834, inclusive, viz:

REVENUE FROM PASSENGERS.

During the Month of	Baltimore.		Ellicotts' Mills.		Frederick.		Point of Rocks.		Total.	
	Passen- gers.	Amount.	Passen- gers.	Amount.	Passen- gers.	Amount.	Passen- gers.	Amount.	Passen- gers.	Amount.
October,	3,906	\$4,677.59	1,722	\$679.57	2,285	\$3,281.86	428	\$514.45	8,341	\$9,153.47
November,	2,971	3,700.71	1,758	701.18	1,936	2,597.74	417	413.73	7,082	7,413.36
December,	2,434	2,688.38	1,553	598.55	1,079	2,183.34	501	440.45	6,167	5,910.72
January,	1,586	1,747.98	1,097	415.44	1,181	1,635.69	265	280.48	4,129	4,079.59
February,	1,523	1,813.08	1,256	461.81	1,381	2,052.64	118	220.64	4,278	4,548.17
March,	2,308	2,636.39	1,725	635.70	1,749	2,571.71	326	361.92	6,108	6,205.72
April,	2,547	3,211.37	1,792	652.85	1,833	2,667.99	560	709.51	6,732	7,241.72
May,	2,992	3,344.98	2,348	873.39	1,970	2,413.36	721	799.31	8,031	7,431.04
June,	3,916	3,740.12	2,628	1,033.67	1,998	2,469.25	710	778.56	9,252	8,021.60
July,	4,750	4,076.41	3,525	1,269.37	2,531	2,813.46	808	936.22	11,614	9,095.46
August,	5,332	4,830.87	3,671	1,357.86	3,152	3,712.73	1,037	1,008.59	13,192	10,910.05
September,	4,128	4,202.36	2,322	801.77	2,421	3,052.10	1,047	1,114.66	9,918	9,170.89
Total,	38,393	40,670.24	25,397	9,481.16	24,116	31,451.87	6,938	7,578.52	94,844	89,181.79

No. 2.

Statement of the Revenue received for the Transportation of Tonnage on the Baltimore and Ohio Rail Road, from the 1st of October, 1833, to the 30th of September, 1834.

During the Month of	Westwardly.		Eastwardly.		Total.	
	Tonnage.	Amount.	Tonnage.	Amount.	Tonnage.	Amount.
October,	2,639.12.3.3	6,511.18	2,696. 4.3.2	4,955.67	5,335.17.3.1	11,466.85
November,	2,254. 6.0.2	4,948.15	3,379.17.2.2	5,556.57	5,634. 3.3.0	10,504.72
December,	1,642. 4.3.2	3,725.34	3,032.11.1.3	5,650.33	4,674.16.1.1	9,375.67
January,	966.19.2.1	2,272.67	3,005. 1.1.0	5,365.76	3,972. 0.3.1	7,638.43
February,	1,379.18.0.0	2,813.01	2,704.11.2.0	6,127.80	4,084. 9.2.0	8,940.81
March,	1,541.10.3.2	3,323.71	2,312. 8.1.0	5,513.98	4,353.19.0.2	8,837.69
April,	1,648. 9.2.0	4,480.63	3,052. 3.2.2	5,167.29	4,700.13.0.2	9,647.92
May,	1,625.12.2.1	4,196.49	3,476. 6.1.2	7,387.45	5,101.18.3.3	11,583.94
June,	1,075. 7.2.2	3,687.21	3,045. 7.3.0	5,504.73	4,120.15.1.2	9,191.94
July,	1,084.13.1.1	3,034.48	2,173. 5.0.1	3,871.78	3,257.18.1.2	6,906.26
August,	2,004.14.2.2	4,526.40	3,030. 2.2.1	5,689.17	5,034.17.0.3	10,215.57
September,	2,065. 9.0.0	4,825.26	3,783.18.2.2	7,119.73	5,849. 7.2.2	11,944.99
Total,	19,928.19.0.0	48,344.53	36,191.18.3.3	67,910.26	56,120.17.3.3	116,254.79

No. 3.

Statement of the Aggregate Revenue received on the Baltimore and Ohio Rail Road, from the 1st October, 1833, to the 30th September, 1834, viz:

During the Month of	From Passengers.		From Tonnage.		Total.
	Passengers.	Amount.	Tons.	Amount.	
October,	8,541	\$9,153.47	5,335.17.3.1	\$11,466.85	\$20,620.32
November,	7,082	7,413.36	5,634. 3.3.0	10,504.72	17,918.08
December,	6,167	5,910.72	4,674.16.1.1	9,375.67	15,286.39
January,	4,121	4,079.59	3,972. 0.3.1	7,638.43	11,718.02
February,	4,278	4,548.17	4,084. 9.2.0	8,940.81	13,488.98
March,	6,108	6,205.72	4,353.19.2.0	8,837.69	15,043.41
April,	6,732	7,241.72	4,700.13.0.2	9,647.92	16,889.64
May,	8,031	7,431.04	5,101.18.3.3	11,583.94	19,014.98
June,	9,252	8,021.60	4,120.15.1.2	9,191.94	17,213.54
July,	11,434	9,095.46	3,257.18.1.2	6,906.26	16,001.72
August,	13,192	10,910.05	5,034.17.1.3	10,215.57	21,125.62
September,	9,918	9,170.89	5,849. 7.2.2	11,944.99	21,115.88
Total,	94,844	\$89,181.79	56,120.17.3.3	\$116,254.79	\$205,436.58

RECAPITULATION.

Transportation.	Revenue.
94,844 Passengers.	\$89,181.79
56,120.17.3.3 Tons.	116,254.79
Total, - -	\$205,436.58

C. No. 4.

Statement of the Expenses incurred in working the Baltimore and Ohio Rail Road, together with the apportionment of the same to the accounts to which they respectively belong—for the official year commencing the 1st October, 1833, and ending the 30th September, 1834,—viz:

Item:	Appertaining to			Total.
	Passengers.	Tonnage.		
No. 1. Moving Power, including feed, shoeing and attendance upon the Stock, their harness and pay of drivers, the expense of working the Railway in the streets and the Inclined Planes, together with the estimated wear and tear of horses, &c. and their depreciation of value, (\$5,600,) - - - - -	\$25,851 83	\$38,576 48		\$64,428 31
2. Agents and Conductors, together with the salary of the Superintendent of transportation. - - - - -	5,538 98	7,914 22		13,453 20
3. Depot Expenses, \$6,281.03 and expense of Stations on the road, and of supervisors at the same, \$3,800.81, - - - - -	3,585 09	6,496 75		10,081 84
4. Contingencies, - - - - -	3,026 69	3,026 70		6,053 39
5. Repairs of Railway, including the cost of removing slips, opening drains, and the cost of labor in rebuilding a wall near the Hockley Mill, on Patapsco, rendered necessary by an extensive slip, - - - - -	11,397 95	11,397 95		22,795 90
<i>(The following disbursed by the Superintendent of Machinery, \$16,049.77)</i>				
6. Repairs of Wagons, - - - - -		5,501 21		5,501 21
7. Repairs of Coaches and Locomotives, including Engineers' pay, fuel, and general expenses of Engines, - - - - -	8,882 16			8,882 16
8. Contingencies, - - - - -	833 20	833 20		1,666 40
	\$59,115 90	\$73,746 51		\$132,862 41

Months.	Flour.		Tobacco.		Grain.	Meal, &c.	Provisions.	Live Stock.	Whiskey.	Granite.	Soap Stone.	Paving Stone.	Lime and Lime-stone.	Firewood.	Lumber.	Bark.	Iron Ore.	Iron.	Wool.	Cotton.	Leather.	Hardware.	Cotton Goods.	Paper.	Miscellaneous.	Total.
	Bbls.	Weight.	Hhds.	Weight.																						
	Tons.		Tons.		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
October,	13,130	1,265.13.2.1	29	11.14.1.1	5. 4.0.0	65. 1.1.0	15.11.3.3	- -	10.18.0.0	718.16.0.0	20.19.2.0	- -	138.12.3.1	11.19.0.0	15. 9.3.0	9. 3.2.0	116.19.1.0	121.11.0.2	1.10.1.2	1. 1.0.0	25. 0.3.2	39.19.0.0	3.16.2.1	3. 3.2.2	93.16.1.3	2,696. 4.3.2
November,	12,948	1,262. 3.2.2	6	2.10.3.0	11. 1.3.1	71.11.1.3	27. 6.3.2	10.12.0.0	21.15.1.0	805.19.2.0	13. 1.3.0	460. 0.0.0	217.17.2.0	96. 2.0.2	9. 3.2.0	2.17.2.0	4.13.1.0	121.15.1.3	0. 7.0.3	0.13.3.3	25. 8.1.1	107. 1.2.1	1.19.2.0	2. 1.0.1	100.13.3.0	3,379.17.2.2
December,	17,697	1,699. 4.1.0	5	2. 0.0.0	27. 7.2.1	53.17.2.1	89.13.2.0	1. 0.0.0	29. 7.3.2	262. 9.2.0	2.17.0.0	291.10.0.0	51.11.0.0	199.13.2.0	4.11.1.0	3.17.2.0	- -	176.12.3.0	- -	- -	13. 0.3.0	41.10.1.2	1. 0.3.0	1.18.0.0	78. 5.1.1	3,032.11.1.3
January,	14,921	1,440. 8.3.2	8	1. 0.1.0	101. 9.3.0	52.17.0.0	16. 8.3.0	- -	10. 3.3.2	356. 2.2.0	6. 0.2.0	349. 7.1.1	43.15.0.0	245. 8.1.0	27. 9.2.0	5. 2.0.0	- -	164.15.3.0	- -	- -	13. 9.3.2	39. 2.2.1	- -	2.18.2.0	126. 7.0.0	3,005. 1.1.0
February,	13,369	1,280. 0.1.2	-	- -	95. 2.0.1	21.10.1.3	3. 0.2.1	1.10.0.0	27. 6.0.0	518. 7.1.2	- -	69. 2.0.0	92. 0.0.1	285.12.1.0	- -	- -	4.19.0.0	80.12.0.2	- -	- -	11.14.1.2	56. 2.0.2	1.16.2.0	1. 7.3.2	121. 8.1.2	2,701.11.2.0
March,	11,401	1,099.11.3.2	5	3. 6.0.1	19.18.3.3	23. 8.0.0	- -	3. 3.0.0	8. 1.1.3	921.18.3.0	- -	171.10.2.0	88. 4.1.3	52. 9.0.2	- -	3. 1.2.0	115.11.1.0	108.13.3.2	- -	- -	18.11.1.1	66. 1.2.0	- -	2.10.0.0	106. 3.2.2	2,812. 8.1.0
April,	12,439	1,210. 8.2.0	36	11. 3.1.2	14.14.0.0	33.13.0.2	3.00.0.0	- -	2. 0.0.0	1,033.18.3.0	3.10.2.0	200.12.0.0	86.19.2.2	10.15.3.0	1.16.2.0	- -	91.16.3.0	175. 9.1.2	- -	- -	16. 8.2.0	22. 5.0.0	1. 0.0.1	3.12.1.0	123.19.2.1	3,052. 3.2.2
May,	20,486	1,981. 8.3.1	109	10. 6.2.0	59. 2.3.3	56.16.0.2	0. 9.2.0	- -	6.12.1.1	692.10.2.0	7.11.3.0	- -	110. 0.1.0	21. 1.0.0	12.13.2.0	125. 0.2.2	131. 5.2.0	129. 2.1.2	0. 3.0.0	0. 5.2.0	12. 1.1.3	13.10.3.3	2. 2.3.2	2. 4.3.0	71.13.0.3	3,476. 6.1.2
June,	13,793	1,365.11.2.2	201	78. 3.1.1	11.15.2.1	62. 2.3.1	2. 1.1.3	3. 0.0.0	- -	757. 6.3.0	11. 7.0.0	22. 0.2.0	122.11.0.0	6.19.0.0	11.19.2.0	63.18.1.0	167.18.2.0	169. 3.1.3	1. 0.2.0	- -	1.15.0.1	6. 3.3.0	1. 8.1.1	1. 0.2.3	114.17.3.0	3,045. 7.3.0
July,	8,726	843.13.1.3	52	19. 4.3.0	18.19.3.0	37. 8.3.3	- -	1. 0.0.0	- -	679.11.0.0	- -	- -	111.10.0.0	- -	10.17.0.0	1.18.2.0	161.11.2.0	109.13.3.2	6. 0.0.2	- -	6.13.0.1	16.19.2.0	1.14.2.0	3.15.3.1	139.13.2.0	2,173. 5.1.0
August,	18,102	1,752. 5.2.0	186	68.11.3.2	77. 1.1.1	119. 7.0.1	- -	1. 0.0.0	3. 3.1.2	501. 8.0.0	2.13.2.0	- -	120. 1.2.0	3.12.2.0	19.18.0.0	9. 3.3.0	131.13.1.1	67.16.0.3	2. 3.3.1	1. 8.0.0	18.19.1.0	11.11.3.3	- -	1. 9.2.0	113.11.0.3	3,030. 2.2.1
September,	25,191	2,429.11.1.2	161	67.18.0.3	17.17.1.1	141.15.0.1	3. 1.3.2	2. 0.0.0	10.13.1.0	414.17.1.0	2. 6.0.0	3.14.0.0	45. 7.2.2	63.17.2.1	- -	20.13.3.0	208.15.1.0	93. 1.0.0	5. 5.1.3	0.15.0.0	13.14.3.3	36.12.2.0	- -	2.16.0.0	139. 5.0.1	3,783.18.1.3
	182,214	17,630. 4.3.1	801	311.19.1.2	522.15.0.0	741. 8.3.1	160.14.1.3	23. 5.0.0	130. 4.1.2	7,723. 5.3.2	70. 7.2.0	1,568.16.1.1	1,231.13.3.1	997.13.0.2	111. 1.2.0	211.16.3.2	1,138. 3.2.1	1,518.10.1.1	16.10.1.3	4. 3.1.3	176.17.3.0	457. 0.3.0	14.19.0.1	31.18.0.1	1,362. 8.3.0	36,191.18.3.3

RECAPITULATION.

Commodities.	Weight.
	Tons.
Flour,	17,630. 4.3.1
Tobacco,	311.19.1.2
Grain,	522.15.0.0
Meal,	741. 8.3.1
Provisions,	160.14.1.3
Live Stock,	23. 5.0.0
Whiskey,	130. 4.1.2
Granite,	7,723. 5.3.2
Soap Stone,	70. 7.2.0
Paving Stone,	1,568.16.1.1
Lime and Lime Stone,	1,231.13.3.1
Firewood,	997.13.0.2
Lumber,	111. 1.2.0
Bark,	211.16.3.2
Ore,	1,138. 3.2.1
Iron,	1,518.10.1.1
Wool,	16.10.1.3
Cotton,	4. 3.1.3
Leather,	176.17.3.0
Hardware,	457. 0.3.0
Cotton Goods,	14.19.0.1
Paper,	31.18.0.1
Miscellaneous,	1,362. 8.3.0
Total,	36,191.18.3.3

Unitware.	Cotton Goods.	Paper.	Miscellaneous	Total.
	Tons.	Tons.	Tons.	Tons.
3.149.0.0	3.16.2.1	3. 3.2.2	93.16.1.3	2,696. 4.3.2
6.19 1.2.1	1.19.2.0	2. 1.0.1	100.13.3.0	3,379.17.2.2
2. 90.1.2	1. 0.3.0	1.18.0.0	78. 5.1.1	3,032.11.1.3
5. 52.2.1	- -	2.18.2.0	126. 7.0.0	3,005. 1.1.0
3. 72.0.2	1.16.2.0	1. 7.3.2	124. 8.1.2	2,704.11.2.0
1. 12.0	- -	2.10.0.0	106. 3.2.2	2,812. 8.1.0
3. 15.0.0	1. 0.0.1	3.12.1.0	123.19.2.1	3,052. 3.2.2
2. 140.3.3	2. 2.3.2	2. 4.3.0	71.13.0.3	3,476. 6.1.2
7. 13.3.0	1. 8.1.1	4. 0.2.3	144.17.3.0	3,045. 7.3.0
0.119.2.0	1.14.2.0	3.15.3.1	139.13.2.0	2,173. 5.1.0
1. 11.3.3	- -	1. 9.2.0	113.11.0.3	3,030. 2.2.1
4.112.2.0	- -	2.16.0.0	139. 5.0.1	3,783.18.1.3
3. 0.3.0	14.19.0.1	31.18.0.1	1,362. 8.3.0	36,191.18.3.3

No. 5.

General Statement of Receipts and Expenses of the Baltimore and Ohio Rail Road Company, from the 1st of October, 1833, to the 30th September, 1834, embracing the amounts disbursed for Transportation, and for the maintenance and repairs of the Railway, and of Machinery, by the Superintendents respectively charged with those departments.

EXPENDITURES.		RECEIPTS.	
Expenses of Transportation, items No. 1, 2, 3, and 4, per Table C, No. 4, -	\$94,016 74	Revenue from Tonnage, per Table C, No. 2, -	\$116,254 79
Repairs of Railway, &c. item No. 5, per Table C, No. 4, -	22,795 90	Revenue from Passengers, per Table C, No. 1, -	89,181 79
Repairs of Machinery, &c. items No. 6, 7, and 8, per Table C, No. 4, -	16,049 77		—
			\$205,436 58
Net Revenue, - - -	72,574 17		
	\$205,436 58		\$205,436 58

[D.]

OFFICE OF THE TREASURER OF THE
Baltimore and Ohio Rail Road Co. }
 1st October, 1831. }

PHILIP E. THOMAS, ESQ.

President.

Sir—The following statement in relation to the fiscal operations of the Baltimore and Ohio Rail Road Company during the past year is respectfully submitted.

Your ob't serv't,

W. H. MURRAY,
 Treasurer of B. & O. R. R. Co.

*The Baltimore and Ohio Rail Road Company, in account with
 William H. Murray, Treasurer.*

To Cash paid Chesapeake and Ohio Canal Company, for graduation of that portion of the 6th Division, between the Point of Rocks and Harper's Ferry, undertaken by that Company,	\$155,166.67
" Cash paid Graduation and Masonry on that part of the Road not undertaken by the Chesapeake and Ohio Canal Company,	106,537.82
" Cash paid construction of Depots, Stables, Turnouts, Sidelings, and Engine house,	11,676.19
" Cash paid materials for Rail Tracks,	5,163.17
" Cash paid construction of Carriages, Wagons, &c.	69,683.60
" Cash paid construction of Locomotive Engines,	16,426.99
" Cash paid Engineer department,	5,492.51
" Cash paid damages and right of way,	8,864.00
" Cash paid for Patent Rights,	2,500.00
" Cash paid Law Expenses,	2,002.75
" Cash paid Office Expenses, Salaries, and Contingencies,	5,540.70
" Cash paid Instalments on the Washington Rail Road Stock,	375,520.00
" Cash advanced to the Washington Rail Road,	28,406.67
" Cash paid Union Bank, loan refunded,	200,000.00
" Cash paid Mechanics Bank, loan refunded,	75,000.00
To Cash paid Interest on State and City Stocks, and to Banks,	32,424.87

" Cash paid expenses of Transportation, per return of the Superintendent,	\$88,416.74	
" Cash paid Horse Feed on hand, provided for the next winter's consumption,	6,928.04	95,344.78
" Cash paid repairs of Rail Road and Machinery,	38,815.67	
Materials on hand for future use,	990.50	39,836.17
Unexpended balances in the hands of disbursing officers,		33,130.57
		<u>\$1,268,717.46</u>

By Balance on hand at the credit of the Company, as per last Annual Report,	\$54,820.97
" Cash received for Instalments on 29,895 Shares of Stock, <i>a</i> \$5.00,	149,475.00
" Cash received, being the final payment upon 5,000 shares, owned by the State of Maryland,	125,000.00
" Cash received, being the final payment upon 5,000 shares, owned by the City of Baltimore, say proceeds of sale of \$175,000, five per cent. Stock, issued by the City,	175,756.08
" Cash received from sale of forfeited Stock,	940.00
" Cash received for revenue from 30th September, 1833, to 30th September, 1834, per return of Superintendent,	205,436.58
" Arrearages of revenue not collected last year,	17,537.34
" Cash received for Bonds issued to Union Bank of Maryland, applicable to the payment of Instalments on Stock in the Washington Rail Road,	500,000.00
" Balance,	39,751.49
	<u>\$1,268,717.46</u>

The Company have acquired since the last Annual Report, in addition to the real estate which it then owned, the following pieces of property, viz:

1st. Three lots in the town of Berlin, situated half way between the Point of Rocks and Harper's Ferry. This purchase will afford a convenient *depot* immediately where the Railway is

crossed by a County road which opens a communication with Loudoun County, in Virginia, and the Middletown Valley, in Maryland.

- 2d. That piece or parcel of land lying between the Baltimore and Ohio and the Washington Rail Roads, at the point of their separation near the Viaduct over the Patapsco.
- 3d. A lot of ground adjoining the land heretofore conveyed to the Company by James Carroll, for the Mount Clare Depot. This lot is situated north of that depot, and affords a convenient communication with Pratt street.

W. H. MURRAY, *Treas'r*,
B. & O. R. R. Co.

THE BALTIMORE AND OHIO RAIL ROAD COMPANY,

Washington Branch,

In account current with Wm. H. Murray, Treas'r.

Cr.

By Cash Received on 10,000 Shares of Stock, being \$50 per Share, - - -	\$500,000.00
" Cash received from the sale of Stock, received from the State of Maryland, - -	350,000.00
" Cash received from the Mechanics' Bank of Baltimore, as a loan, -	75,000.00
" Cash received from the Baltimore and Ohio Rail Road Company, -	28,406.67
	<hr/>
	\$953,406.67

Dr.

To Cash paid Engineer department, -	\$27,812.35
" Cash paid for Right of Way, -	71,651.23
" Cash paid for Graduation and Masonry, - - -	698,950.61
" Cash paid Department of Construction, being for materials for Rail track, - - -	56,096.51
" Cash paid Department of Machinery, including purchase of patents, - - -	3,437.50
" Cash paid Interest on Loans, -	13,658.29
" Cash paid Law expenses, -	675.00
" Cash paid Office expenses, Salaries, and Contingencies, -	4,102.51
Unexpended balances in the hands of disbursing officers, -	44,591.68
Balance on hand this day, -	32,430.96
	<hr/>
	\$953,406.67

W. H. MURRAY, *Treas'r.*

[E.]

Fifth Annual Report of the Superintendent of Graduation, Masonry and Construction of the Baltimore and Ohio Rail Road.

*Office of the Superintendent of the Graduation, }
Masonry and Construction of the Baltimore }
and Ohio Rail Road. 1st Oct. 1834. }*

TO PHILIP E. THOMAS,

President of the Balt. & Ohio Rail Road Co.

Sir,—As a full and detailed report in relation to the work placed under my superintendence, will necessarily be made, as soon as it shall have been completed, and as the entire Road to Harper's Ferry is now almost finished, as well as the graduation and masonry of that part of the Washington Road that has been authorised to be put under contract, I consider it only necessary in this report to give you a general view of the condition of the work at the present time, and to state the periods when the same will be finished.

The entire graduation and masonry of the Baltimore and Ohio Rail Road, as far as to Harper's Ferry, is completed, except that it may yet be necessary to remove a few points of projecting rocks on the north side of the road, between the Point of Rocks and the Ferry.

The materials for the construction of the rail tracks on this road have been provided, and the greater portion of them distributed along the line of the work.

The laying of the Rails has been commenced, at different points, and will be completed by the end of next month. Materials of the best quality are in a course of preparation for the horse path, and will be applied as fast as the laying of the Rails advances, so that the whole Road will be ready for travel and traffic, within a few days after the laying of the Rails shall have been finished.

The graduation of the Washington Rail Road is completed as far as to the District line, with the exception of the deep cuts. These, it is confidently expected, will also be finished by the first day of January next.

The Masonry on this road is all completed except the "*Thomas Viaduct*" over the Patapsco, and this stupendous structure, it is not doubted, will be finished in due time, to receive the Rails, with the other parts of the road.

The Masonry on this road, between its deflection from the Baltimore and Ohio Rail Road and the line of the District of Columbia, will be about 39,000 perches. It has been executed in the most substantial and permanent manner, and so far it has shewn no indication of the least imperfection either as regards its foundations, materials or construction. Indeed I believe that it may safely be as-

serted that, there is not any better executed stone work, either as respects durability or appropriateness to the purpose intended, in this country.

The requisite materials, for laying down the Rails on the entire line of this road, are nearly all distributed along the road, except the iron rails and their necessary fixtures, only a part of which have been received.

The whole have however been ordered, and we have assurances that they will be received by the time they may be wanted. The actual laying of the Rails, at several points along the Washington road, has been commenced under three different contractors, and the whole will be completed by the 1st day of July next, or earlier, should the iron arrive in time.

If the Board conclude within the present month, to authorise the graduation of that part of this road, lying within the District of Columbia, it may also be completed by the middle of next summer, so as to have the rails laid there and the whole line in operation for travel and transportation within less than one year from this date.

Respectfully submitted,

CASPAR W. WEVER,
Superintendent, &c.

3 1430 03046099 4



a31430030460994b
UNIV. OF MD. COLLEGE PARK



JUN 76



N. MANCHESTER,
INDIANA

